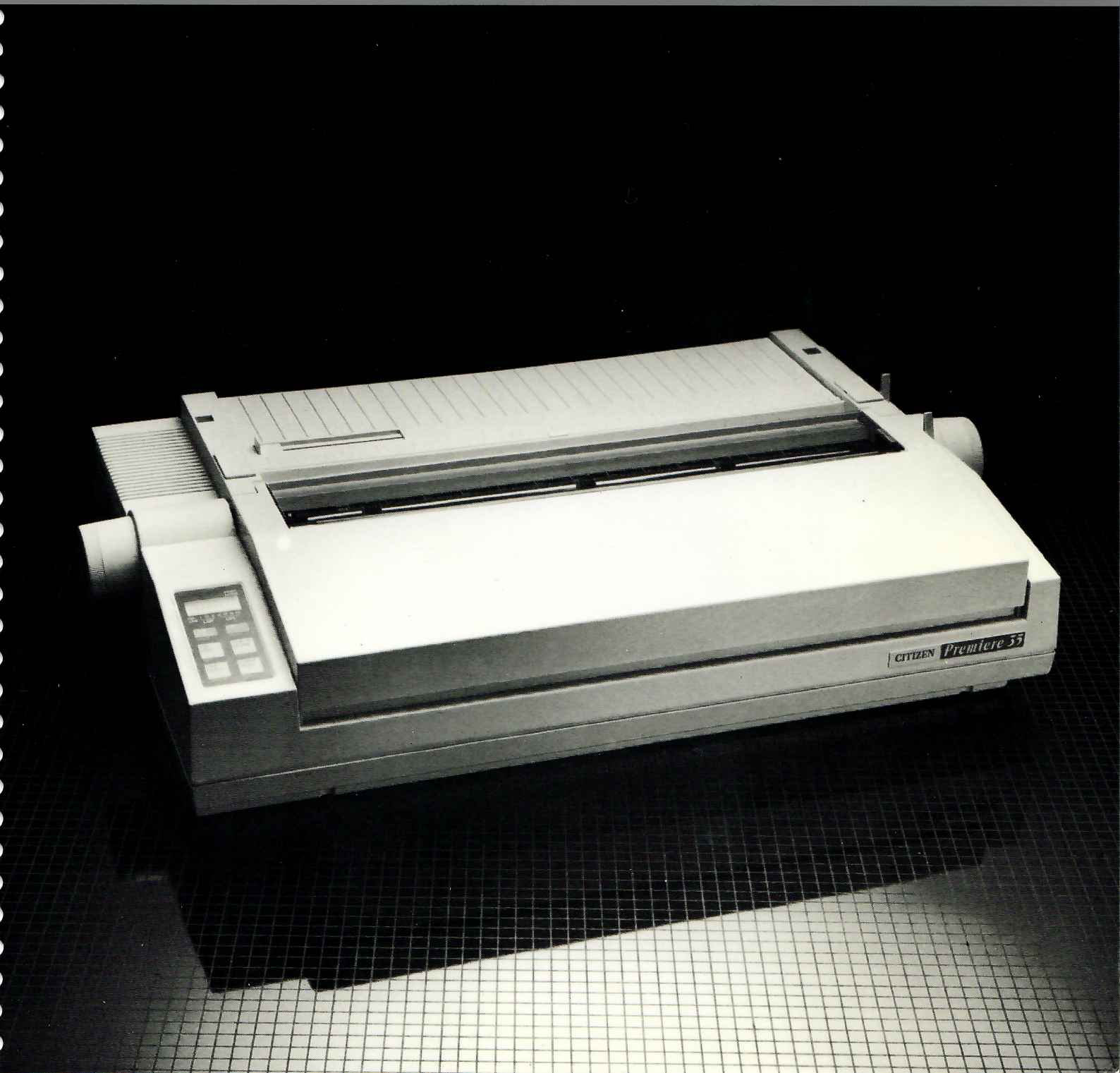
Premiere 35 Reference Manual

CITIZEN™



CITIZEN™ Premiere 35 Reference Manual

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"How to Identify and Resolve Radio-TV Interference Problems."

This booklet is available from the U.S. Government Printing Office, Washington DC 20402. Stock No. 004-000-00345-4.

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Introduction

The Citizen Premiere 35 has many features that greatly increase the flexibility of your word processing environment. All of the Premiere 35's unique features are described in the Premiere 35 User's Manual that came with your printer.

For the most part, this manual will be used by programmers and others who want to write or run programs that use their Premiere 35. Their main interest will be how the Premiere 35 commands work, which brings us to one of the great features of the Premiere 35: its code compatibility with three popular printers (Diablo 630, NEC 3550, and Qume Sprint 11). These three command sets are switch selectable, allowing you to use software written for these printers without changing your printer. You get three printers in one!

Another important feature that will interest programmers is its built-in clock/calendar, which can be controlled through software commands (or with the control panel).

As you can see, whatever level of programming knowledge you have, a complete reference manual is essential to help you properly program the printer and take advantage of all the Premiere 35's capabilities. This manual provides the information you need–and more.

ABOUT THE MANUALS

By now you've discovered that you received two manuals with your Premiere 35 printer. There is a *Premiere 35 User's Manual*, which is essentially a "hardware manual," and a Premiere 35 Reference Manual, which is dedicated primarily to software concerns.

The *User's Manual* is designed to get you started. In it you'll learn how to set up, operate, and maintain your printer.

This manual (*the Reference Manual*) describes all of the printer commands in detail. While this information is most useful to programmers and the technically inclined, it will also be of use to casual users, for many of these features can be easily implemented with your word processor.

How is the *Premiere 35 Reference Manual* organized?

First, Chapter 1 describes how to send the Premiere 35 commands in BASIC and provides a programming example, using typical Premiere 35 features.

Chapters 2 through 5 each cover a different command set: Diablo, Qume, NEC, and Premiere 35 unique commands. The commands in each chapter are organized into functional groups (print style, line spacing, page design, and so on).

These four chapters all use the same command format. The *function* is what the printer will do when given the proper command. The *format* is the correct syntax for the ASCII code that the printer understands. This code is shown in its BASIC language format, and as a *hexadecimal* value. Where n(or another letter) is used as a variable, it stands for a numerical value. And the *remarks* section tells how the command works with the Premiere 35 and how it interacts with other commands.

Appendix A lists the commands in numerical order by command set. Appendix B provides an ASCII code conversion chart. Appendix C describes the printer switch settings that you can change to adjust how the Premiere 35 operates.

Appendix D and E explain the parallel and serial interfaces. And Appendix F lists the Premiere 35 specifications.

In addition, you'll find an extensive index and a quick reference card in the back of the manual. We think you'll find the manuals and the Premiere 35 functional and easy to use.

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Chapter 1
Using BASIC

This chapter describes how to send control codes and escape sequences in BASIC. There is also a programming example to show you a typical printing application using Premiere 35 commands.

The BASIC programming language is used in this manual because it is the most widely-used programming language for microcomputers. However, the Premiere 35 works just as well with other high-level languages, such as C or Pascal. Simply send the same ASCII codes to the Premiere 35 with whatever print statements your language uses.

Unfortunately, different computers use slightly different versions of BASIC, especially in the way they send information to the printer. To properly program your printer, you should follow the programming manual for the version of BASIC you are using.

ASCII CODES

ASCII codes are sent to your printer to control how it functions. There are 256 ASCII codes, numbered 0 to 255. The first 128 include the codes for the letters of the alphabet (both lower and upper case), the digits 0 to 9, and punctuation marks. For example, the letter A is ASCII 65; the digit 6 is ASCII 54. ASCII codes 0 through 31 are nonprinting codes, called control codes, that control the Premiere 35's functions.

ASCII codes 128 to 255 are sometimes called the "high-bit" or "8-bit" ASCII characters. They are less standardized than the first 128 and their meaning depends somewhat on the particular equipment and application involved. The Premiere 35 interprets the high-bit ASCII codes the same as the ASCII codes 0 to 127 (in other words, ASCII 128 is the same as ASCII 0, ASCII 129 is the same as ASCII 1, and so on).

Decimal vs. Hexadecimal Numbers

ASCII codes are usually referred to as decimal numbers because they are based on ten– the ten digits 0 through 9. Hexadecimal numbers, or hex numbers for short, are based on 16– the ten digits 0 through 9 and the six letters A through F. To distinguish them from decimal numbers, hex numbers are usually written in one of three ways: followed by an h(e.g. 13h or 6Ah), preceded by an ampersand and H(e.g. &H13 or &H6A), or preceded by a dollar sign(e.g. $13 or $6A).

All have the same meaning. This book uses the first style; hex numbers are followed with an h, as in 6Ah. The ASCII codes in hexadecimal are 00h to FFh. Whether you use decimal

or hexadecimal ASCII codes depends on your computer system and which software program you are using. Appendix B contains a list of the ASCII codes 0 through 127 with their decimal and hex values.

Using Nonprinting Codes in BASIC

Nonprinting, or control codes, are ASCII 0 to 31. BASIC sends nonprinting ASCII codes to the printer by using the CHR$ function. For example, CHR$(10) represents the ASCII code 10, which is a line feed (the paper is advanced one line).

THE ESCAPE CODE

The escape code, or ASCII 27, is used in combination with other codes to control almost all of the Premiere 35 features. In BASIC, the escape code is CHR$(27) and is referred to as ESC in this book.

There are many different ways to send escape sequences in BASIC. For example, to send the ESC M command, the Premiere 35 understands both these BASIC statements:

```
LPRINT CHR$(27) CHR$(77)
LPRINT CHR$(27) "M"
```

Because ESC is used so often, many programmers define CHR$(27) as a string variable in their programs with an assignment statement. For example, you could use:

```
10 ESC$ = CHR$(27)
20 LPRINT ESC$ + "M"
```

USING ASCII VALUES AS ARGUMENTS

Many of the commands used in all three command sets(Diablo, Qume, and NEC) use n(or another letter) as an argument, where n is a numerical value. The minimum and maximum values of n are listed separately with each command. For example, the Qume and Diablo command for an absolute horizontal tab is:

```
CHR$(27) CHR$(9) CHR$(n)
```

where n is the column number you want to tab to.

Appendix B can be used to determine the ASCII code or character to substitute for n.

Some commands use n in its hexadecimal format. For example, the Qume command to set the page length is:

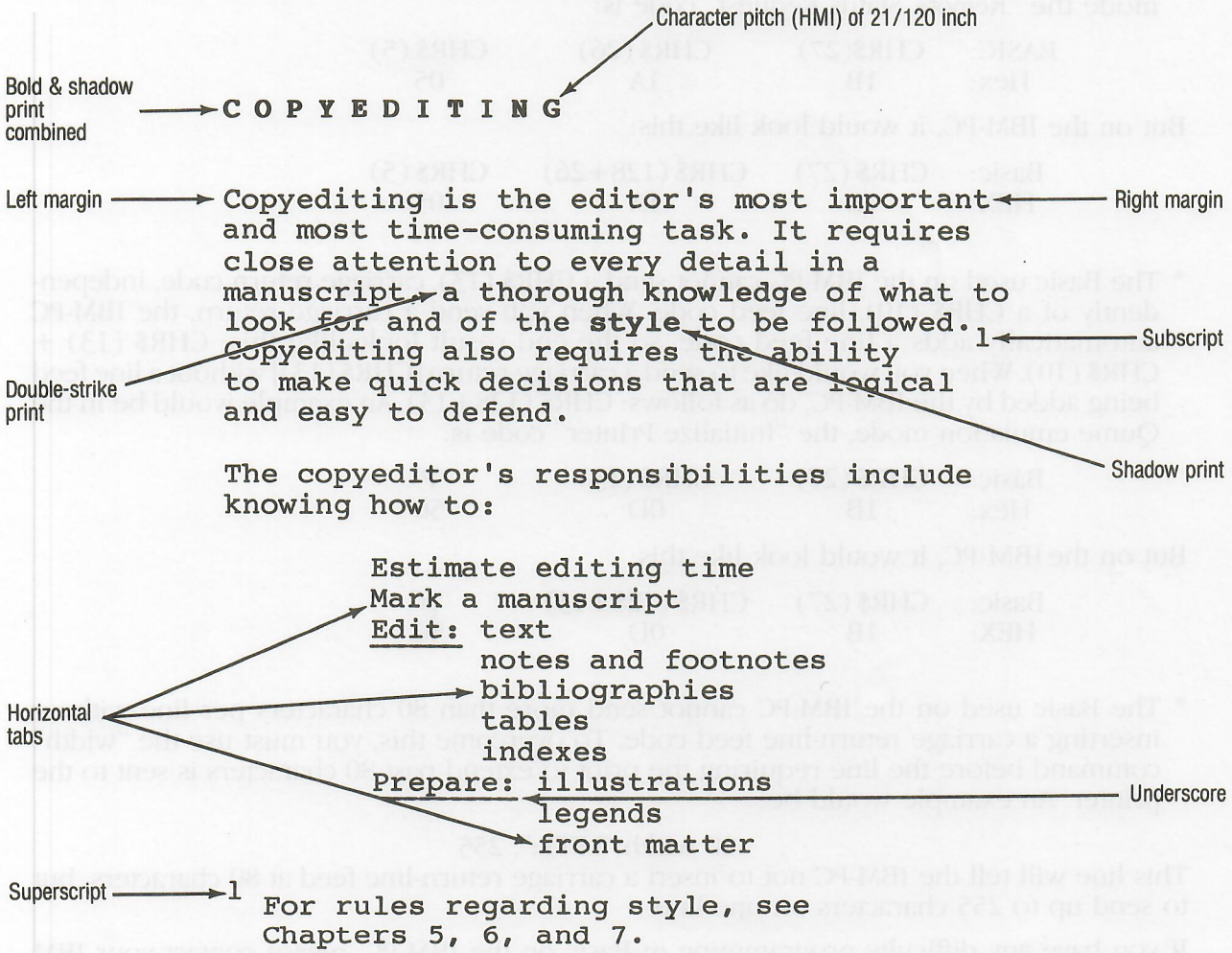
```
CHR$(27) "F" HEX$(n1) HEX$(n2)
```

where n1 and n2 are decimal values expressed in their hexadecimal equivalents.

A PROGAMMING EXAMPLE

The following example shows a typical printing application. The printout was produced using Qume control codes and escape sequences with a simple text editor.

NOTE: To select the Qume Sprint 11 option, set rear switches 3-1 and 3-2 to the ON position.



FOR IBM USERS

When programming in Basic on the IBM-PC, it is important to know certain characteristics about the IBM-PC (or some look-alikes), such as :

* The Basic used by the IBM-PC cannot send a CHR$ (26), the "CNTL Z" control code. When using a control code that requires a CHR$ (26) be sent to the printer, please send as follows: CHR$ (128 + 26). An example would be in the Qume emulation mode the "Remote Status Request" code is:

BASIC:	CHR$(27)	CHR$ (26)	CHR$ (5)
Hex:	1B	1A	05

But on the IBM-PC, it would look like this:

Basic:	CHR$ (27)	CHR$ (128+26)	CHR$ (5)
HEX:	1B	1A	05

* The Basic used on the IBM-PC cannot send a CHR$ (13), carriage return code, independently of a CHR$ (10), line feed code. When you send a carriage return, the IBM-PC automatically adds a line feed code, so the end result looks like this: CHR$ (13) + CHR$ (10). When you would like to send a carriage return [CHR$ (13)] without a line feed being added by the IBM-PC, do as follows: CHR$ (128+13). An example would be in the Qume emulation mode, the "Initialize Printer" code is:

Basic:	CHR$ (27)	CHR$ (13)	"P"
Hex:	1B	0D	50

But on the IBM-PC, it would look like this:

Basic:	CHR$ (27)	CHR$ (128+13)	"p"
HEX:	1B	0D	50

* The Basic used on the IBM-PC cannot send more than 80 characters per line without inserting a carriage return-line feed code. To overcome this, you must use the "width" command before the line requiring the print to extend past 80 characters is sent to the printer. An example would be:

```
10 width "LPT1:", 255
```

This line will tell the IBM-PC not to insert a carriage return-line feed at 80 characters, but to send up to 255 characters on one line.

If you have any difficulty programming in Basic on the IBM-PC, please contact your IBM representative or Citizen America Technical Support for assistance.

Chapter 2
Diablo Command Descriptions

This chapter describes the commands used when the Diablo 630 option is selected. Rear switches 3-1 and 3-2 must be set to the OFF position at power up (see Appendix C for details).

PRINT STYLE COMMANDS

ESC US CHR$(n) (n = 1 to 126)

Function: Sets the character pitch (HMI) to (n-1)/120 inch.

Format:

BASIC	CHR$(27) CHR$(31) CHR$(n)	
Hex	1B 1F nh	(nh = 01h to 7Eh)

Remarks: Character pitch is also referred to as the horizontal Motion Index, or HMI. The HMI is determined in (n-1)/120 inch increments, where the value of n can range from 1 to 126.

ESC S

Function: Selects default character pitch (HMI).

Format:

BASIC	CHR$(27) "S"
Hex	1B 53

Remarks: Returns the character pitch (HMI) to the printing pitch which is indicated to CPI. Character pitch is also referred to as the Horizontal Motion Index, or HMI.

ESC P/ESC Q

Function: Selects/cancels proportional print.

Format:	**ON**	**OFF**
BASIC	CHR$(27) "P"	CHR$(27) "Q"
Hex	1B 50	1B 51

Remarks: Proportional spacing varies the space between characters depending on their width. For example, an "M" is wider than an "l". (With fixed spacing, all characters and spaces are the same width.) A proportional print wheel must be installed to use this feature.

Printing is returned to the previous character pitch selected when you cancel proportional print.

In some cases, commercial software controls the proportional spacing which overrides ESC P and ESC Q.

ESC E/ESC R

Function: Selects/cancels auto underscore.

Format:	**ON**	**OFF**
BASIC	CHR$(27) "E"	CHR$(27) "R"
Hex	1B 45	1B 52

Remarks: All characters and spaces between characters are underscored. This command also underscores centered text (without underscoring the space between the text and each margin). Auto underscore is also canceled by ESC X.

ESC O/ESC &

Function: Selects/cancels bold print.

Format:	**ON**	**OFF**
BASIC	CHR$(27) "O"	CHR$(27) "&"
Hex	1B 4F	1B 26

Remarks: Characters are printed twice with no horizontal or vertical offset. Bold print is sometimes referred to as double-strike printing. Bold and shadow print cannot be combined. Bold print is also canceled by a carriage return (CR) or ESC X.

The select bold print command uses the letter O, not the number zero.

ESC W/ESC &

Function: Selects/cancels shadow print.

Format:	**ON**	**OFF**
BASIC	CHR$(27) "W"	CHR$(27) "&"
Hex	1B 57	1B 26

Remarks: With shadow print, each caracter is printed once, then printed again offset horizontally 1/120 inch. Shadow and bold print cannot be combined. Shadow print is also canceled by a carriage return (CR) or ESC X.

ESC 7

Function: Selects print suppression.

Format:	
BASIC	CHR$(27) "7"
Hex	1B 37

Remarks: When print suppression is selected, all printable characters are replaced with spaces until a carriage return (CR).

ESC %/ESC N

Function: Selects/cancels the carriage settling time increased to 20 msec.

Formats:	**ON**	**OFF**
BASIC	CHR$(27) "%"	CHR$(27) "N"
Hex	1B 25	1B 4E

Remarks: The carriage settling time can be increased to 20 msec by issuing the sequence ESC%. This provides more time for mechanical vibrations to damp out before printing to improve print quality, at a small sacrifice in print speed. The sequence ESC N will restore the normal carriage settling time.

ESC =

Function: Centers text between the left and right margin.

Formats:	
BASIC	CHR$(27) "="
Hex	1B 3D

Remarks: Centers the text between the current left and right margins. If the line goes past the right margin, the line is printed without centering.

ESC M

Function: Selects automatic justification.

Format:

BASIC	CHR$(27) "M"
Hex	1B 4D

Remarks: Automatic justification adjusts the space between words and characters within a line so that it fills the space between the current left and right margins. Automatic justification is canceled by ESC "X".

Justification starts at the first printable character of each line. Leading tabs and spaces are not included in the calculations to justify the text. Word and character spacing is reduced if the line goes past the right margin. Word and character spacing is increased if the line does not reach the right margin.

Justification is applied to space between words and between characters. The line is printed unjustified, if the length of a line of a text exceeds 150% of its original length or less than 90% of its original.

These commands can be used within justified text:

ESC HT	Absolute horizontal tab
ESC BS	Backspace 1/120 inch
ESC E	Select auto underscore
ESC R	Cancel auto underscore
ESC O	Select bold print
ESC W	Select shadow print
ESC &	Cancel bold or shadow print
ESC U	Half line feed
ESC D	Negative (reverse) half line feed
ESC Y	Print special character 20h
ESC Z	Print special character 7Fh

Graphics related command sequences cannot be used in justified text. Any other command sequences must be at the beginning of the line.

ESC CTRL-Q CHR$(n)

Function: Offset selection

Format:

BASIC	CHR$(27)	CHR$(17)	CHR$(n)
Hex		1B 11	nh

Remarks: The normal way to change character spacing is to adjust HMI. However, for proportional space printing, HMI is ignored and table values are used. Thus, to add or subtract a constant to each table size, the 3-character sequence ESC DC1 ("character") should be used. The binary value of the "character" is added to each table size value, or HMI if it is controlling size, as well as to the space character. This continues until another ESC DC1 (character) sequence is received, or until offset is cleared by a carriage return (CR) or the sequence ESC X.

The seven bits of the "character" are defined as follows:

Bits 1 – 6	=	Size of offset	(63 units maximum – 1/120″ per unit)
Bit 7	=	Sign of offset	(1 = negative)

If a negative offset (smaller character size) is desired, bit 7 should be set. If the resulting character size is zero or less, no carriage movement will occur. Note that because NUL and DEL cannot pass thru the serial receiver, positive offset values range from 1 thru 63 (0 000001 thru 0 111111), and negative values range from 0 thru 62 (1 000000 thru 1 111110). Refer to the appendix B of this manual for a Code Chart showing the ASCII characters corresponding to these values.

ESC X

Function: Cancels word processing features.

Formats:

BASIC	CHR$(27)	"X"
Hex	1B	58

Remarks: Word processing features canceled include: character offset, auto underscore, bold and shadow print, center text, auto justification and program mode. Proportional spacing is not canceled (use ESC Q instead.)

PROGRAM MODE

ESC CTRL-N M/SI or ESC X

Function: Selects/canceles program mode.

Format:	**ON**	**OFF**
BASIC	CHR$(27) CHR$(14) "M"	CHR$(15) or CHR$(27) "X"
Hex	1B 0E 4D	0F or 1B58

Remarks: Program mode enables user control of spoke position,hammer energy, and ribbon advance. This allows the use of special print wheels without modifications to the Premiere 35. This mode is the same as the secondary program mode of the Qume. See ESC # (page 51) of the Qume Command Descriptions.
Program mode is initiated by the sequence ESC SO M. It is turned off by either the control character SI or the sequence ESC X.

LINE SPACING COMMANDS

CTRL-M (Carriage Return)
(also RETURN or ENTER)

Function: Returns the print head to the left margin after printing.

Format:	
BASIC	CHR$(13)
Hex	0D

Remarks: A carriage return moves the print head to the left margin, but does not advance the paper to the next line. Therefore, many computers automatically add a line feed (CTRL-J or ASCII 10) to each carriage return.

If your computer does not automatically add line feeds, you can turn rear switch 2-4 ON (see Appendix C) and the Premiere 35 will add a line feed to each carriage return it receives.

ESC ?/ESC !

Function: Selects/cancels auto carriage return.

Format:	**ON**	**OFF**
BASIC	CHR$(27) "?"	CHR$(27) "!"
Hex	1B 3F	1B 21

Remarks: The Auto Carriage Return mode is enabled by ESC ? and disabled by ESC !. When this mode is enabled, a carriage return occurs automatically when the carriage reaches print column 136. An automatic carriage return also causes a line feed, regardless of the setting of the AUTO LF switch (SW 2-4).

CTRL-J (Line Feed)

Function: The line feed advances the paper to the next line after printing.

Format:

BASIC	CHR$(10)
Hex	0A

Remarks: Many computers automatically add a line feed to each carriage return. If yours does not, you can turn rear switch 2-4 ON (see Appendix C).

ESC "/ESC #

Function: Selects/cancels automatically line feed.

Format:	**ON**	**OFF**
BASIC	CHR$(27) CHR$(34)	CHR$(27) "#"
Hex	1B 22	1B 23

Remarks: Auto line feed mode is evabled by ESC"and disabled by ESC#. A line feed is also performed automatically as a result of a carriage return operation when AUTO LF (switch 2-4) is ON.

ESC CTRL-J

Function: Negative (reverse) line feed.

Format:

BASIC	CHR$(27) CHR$(10)
Hex	1B 0A

Remarks: A reverse line feed moves the paper down one line of the current line spacing, thus moving the printing position back toward the top of the page. Line spacing (VMI) is set with ESC RS.

ESC U

Function: Half line feed.

Format:

BASIC	CHR$(27) "U"
Hex	1B 55

Remarks: A half line feed moves the paper one half line of the current line spacing. Line spacing (VMI) is set with ESC RS. You can use ESC U in combination with ESC D to print superscripts and subscripts.

ESC D

Function: Negative (reverse) half line feed.

Format:

BASIC	CHR$(27) "D"
Hex	1B 44

Remarks: A reverse half line feed moves the paper down one half line of the current line spacing, thus moving the printing position back toward the top of the page. Line spacing (VMI) is set with ESC RS. You can use ESC D in combination with ESC U to print superscripts and subscripts.

ESC RS CHR$(n) (n = 1 to 126)

Function: Sets the line spacing (VMI) to (n-1)/48 inch.

Format:

BASIC	CHR$(27) CHR$(30) CHR$(n)	
Hex	1B 1E nh	(nh = 01h to 7Eh)

Remarks: This command sets the line spacing for subsequent line feeds. Line spacing is also referred to as the Vertical Motion Index, or VMI. The VMI is determined in (n-1)/48 inch increments, where the value of n can range from 1 to 126.

PAGE DESIGN COMMANDS

CTRL-L (Form Feed)

Function: Advances the paper to the next page, either to the top of form or the current top margin.

Format:

BASIC	CHR$(12)
Hex	0C

Remarks: The top margin is set with ESC T. The top of form, or TOF, is set by the position of the paper when:

— the printer is turned on.

— when the control panel TOP OF FORM button is pressed.

— when the printer is initialized (ESC CR P or ESC SUB I).

— when the page length is set with ESC FF.

— when the paper is inserted by operating of the paper bail.

ESC CTRL-L CHR$(n) (n = 1 to 126)

Function: Sets the page length to n lines.

Format:

BASIC	CHR$(27) CHR$(12) CHR$(n)	
Hex	1B 0C nh	(nh = 01h to 7Eh)

Remarks: This command sets the length of the page to n lines, where n can range from 1 to 126. This command clears the top and bottom margins set by ESC T and ESC L, respectively and sets the top of form at the current paper position.

The page length, being stored as an absolute distance, does not change if you subsequently change the line spacing with ESC RS.

ESC 9

Function: Sets the left margin.

Format:

BASIC	CHR$(27) "9"
Hex	1B 39

Remarks: Sets a left margin at the current print head position. Before this command is used, the print head must be moved left or right, to the column position where you want the margin to be set.

ESC 0

Function: Sets the right margin.

Format:

BASIC	CHR$(27) "0"
Hex	1B 30

Remarks: Sets a right margin at the current print head position. Before this command is used, the print head must be moved left or right, to the column position where you want the margin to be set.

This command uses the number zero, not the letter O.

ESC $/ESC *

Function: Selects/cancels right margin control.

Format:	**ON**	**OFF**
BASIC	CHR$(27) "$"	CHR$(27) "*"
Hex	1B 24	1B 2A

Remarks: A carriage return and line feed are provided on the first space or hyphen after entering a "hot zone" of five characters before the right margin.

The carriage return provided by Margin Control does not clear Bold or Shadow Print modes. It will cause Auto Underscore to operate the same as it does for a normal CR command.

ESC T

Function: Sets the top margin.

Format:

BASIC	CHR$(27) "T"
Hex	1B 54

Remarks: Sets the top margin at the current paper position. Before this command is used, the paper must be moved up or down, to the line where you want the margin to be set.

The top margin is changed to the top of form (the current paper position) when you set the page length with ESC FF, or when you clear the top and bottom margins with ESC C.

ESC L

Function: Sets the bottom margin at the current paper position.

Format:

BASIC	CHR$(27) "L"
Hex	1B 4C

Remarks: Before this command is used, the paper must be moved up or down, to the line where you want the margin to be set.

The bottom margin is cleared when you set the page length with ESC FF, or when you clear the top and bottom margins with ESC C. The new bottom margin becomes the page length.

ESC C

Function: Clears the top and bottom margins.

Format:

BASIC	CHR$(27) "C"
Hex	1B 43

Remarks: Clears the top and bottom margins set by ESC T and ESC L, respectively. The current paper position becomes the top of form and the new top margin. The new bottom margin becomes the power on default page length set by rear switches 2-1, 2-2, and 2-3 (see Appendix C).

HORIZONTAL MOTION COMMANDS

CTRL-H (Backspace)

Function: Moves the print head left one character to overprint.

Format:

BASIC	CHR$(8)
Hex	08

Remarks: The print head can be moved to the extreme left side as far as the left margin with multiple backspaces.

ESC CTRL-H

Function: Fine back space at 1/120 inch.

Format:

BASIC	CHR$(27) CHR$(8)
Hex	1B 08

Remarks: The print head can be moved to backward a 1/120 inch movement.

ESC

Function: Selects unidirectional printing. (Diablo term is disable auto backward printing.)

Format:

BASIC	CHR$(27) " \ "
Hex	1B 5C

Remarks: This command causes each line to be printed from left to right, allowing very fine vertical alignment between lines (for columns, grids, and so on).

Unidirectional printing can be set as the power on default by turning rear switch 2-8 ON.

ESC /

Function: Selects bidirectional printing. (Diablo term is enable auto backward printing.)

Format:

BASIC	CHR$(27) "/"
Hex	1B 2F

Remarks: Bidirectional printing maximizes printing speed. Bidirectional printing can be set as the power on default by turning rear switch 2-8 OFF.

ESC 6/ESC 5

Function: Selects/cancels backward printing.

Format:	**ON**	**OFF**
BASIC	CHR$(27) "6"	CHR$(27) "5"
Hex	1B 36	1B 35

Remarks: Backward printing prints lines from right-to-left rather than left-to-right (as with forward printing). Spaces and backspaces are also reversed, however, tab settings, carriage returns, and paper movement are not affected. A carriage return (CR) also cancels backward printing.

ESC </ESC>

Function: Selects/cancels reverse printing.

Format:	**ON**	**OFF**
BASIC	CHR$(27) "<"	CHR$(27) ">"
Hex	1B 3C	1B 3E

Remarks: Reverse printing prints lines from right-to-left and reverses the entire horizontal movement of the page, including tabbing and backspacing. The starting point for each line is the right margin because a carriage return moves the print head to the rightmost position (instead of the leftmost as with forward printing).

Reverse printing can be used to print foreign languages and other applications that require a complete reversal of the printed page.

TAB COMMANDS

CTRL-I (Horizontal Tab)

Function: Moves the print head to the next horizontal tab setting.

Format:	
BASIC	CHR$(9)
Hex	09

Remarks: A horizontal tab moves the print head to the right to the next horizontal tab position set by ESC 1. Horizontal tab settings are column-dependent, that is the tab position changes on the paper according to the change in character pitch. At power on, there are no tab settings.

If no tab stop has been set to the right of the present carriage position, the print head will not move and alarm will sound.

ESC 1

Function: Sets a horizontal tab at the current print head position.

Format:

BASIC	CHR$(27) "1"
Hex	1B 31

Remarks: Before this command is used, the print head must be moved left or right, to the column position where you want the horizontal tab to be set. Up to 100 horizontal tab positions can be set. Because they are stored as column numbers (max. 255 columns), the position of tab settings change with subsequent changes in character pitch (HMI).

ESC 8

Function: Clears a horizontal tab at the current print head position.

Format:

BASIC	CHR$(27) "8"
Hex	1B 38

Remarks: Before this command is used, the print head must be moved left or right, to the column position where you want the horizontal tab to be cleared.

ESC CTRL-I CHR$(n) (n = 1 to 126)

Function: Absolute horizontal tab to column n-1.

Format:

BASIC	CHR$(27) CHR$(9) CHR$(n)	
Hex	1B 09 n	(nh = 01h to 7Eh)

Remarks: This command moves print head horizontally, either left or right, to column n-1 of the current character pitch (HMI). The leftmost print position is column 0. The value of n can range from 1 to 126. In case of 7-bit selection (SW 2-7: OFF), if n is greater than 128, then 128 is subtracted from n, resulting in a column value between 1 and 126. If n is 0, 127, 128, or 255, the command is ignored.

CTRL-K (Vertical Tab)

Function: Moves the print head to the next vertical tab position.

Format:

BASIC	CHR$(11)
Hex	0B

Remarks: A vertical tab advances the paper to the next vertical tab position set by ESC−. Tab settings are not affected by changes in line spacing (VMI). At power on, there are no tab settings.

If there are no vertical tab settings beyond the current paper position, the paper will not move and the audible alarm will sound.

ESC -

Function: Sets a vertical tab at the current paper position.

Format:

BASIC	CHR$(27) "-"
Hex	1B 2D

Remarks: Before this command is used, the paper must be moved, up or down, to the line where you want the vertical tab to be set. Up to 128 vertical tab positions can be set.

ESC CTRL-K CHR$(n) (n = 1 to 126)

Function: Absolute vertical tab to line n-1.

Format:

BASIC	CHR$(27) CHR$(11) CHR$(n)	
Hex	1B 0B nh	(nh = 01h to 7Eh)

Remarks: This command moves print head vertically, either up or down, to line n-1 of the current line spacing (VMI). The top of form position is line 0. The value of n can range from 1 to 126. In case of 7-bit selection (SW 2-7: OFF), if n is greater than 128, then 128 is subtracted from n, resulting in a column value between 1 and 126. If n is 0, 127, 128, or 255, the command is ignored.

ESC 2

Function: Clears all horizontal and vertical tabs.

Format:

BASIC	CHR$(27) "2"
Hex	1B 32

Remarks: Clears all the horizontal and vertical tab positions set by ESC 1 and ESC -, respectively. (To clear individual horizontal tab positions, use ESC 8.)

TEST COMMANDS

ESC CTRL-Z 1

Function: Status 1 request.

Format:

BASIC	CHR$(27) CHR$(26) "1"
Hex	1B 1A 31

Remarks: This command causes the Premiere 35 to send a status report byte from the printer. The true-state bit definitions for this byte are:

Bit	*Status*
0	End of Ribbon
1	10 Pitch (This bit false if any other pitch is selected)
2	Paper Out
3	Auto Line Feed enabled (set by rear switch, or by ESC sequence if no control panel)
4	Cover Open
5	Printer Idle (no motion, and print queue empty)
6	Always "0"
7	Always "0"

ESC CTRL-Z 2

Function: Status 2 request.

Format:

BASIC	CHR$(27) CHR$(26) "2"
Hex	1B 1A 32

Remarks: This command causes the Premiere 35 to send a status report byte from the printer. The true-state definitions for this status byte are:

0	Always "0"
1	Always "0"
2	Auto Carriage Return enabled
3	Always "0"
4	Reverse Print Mode (inverted horizontal motion)
5	Paper Out Defeat enabled (always 0 if no control panel)
6	Full-Duplex enabled
7	Always "0"

MISCELLANEOUS COMMANDS

CTRL-G (Bell)

Function: Sounds printer's alarm.

BASIC	CHR$(7)
Hex	07

Remarks: Sounds the Premiere 35's buzzer for 0.5 second.

ESC CTRL-M P

Function: Initializes the printer.

Format:

BASIC	CHR$(27) CHR$(13) "P"
Hex	1B 0D 50

Remarks: Resets (initializes) the printer to the power on default values:

— the print head is returned to the left most position.

— the top of form position is set at the current paper position.

— the printer is placed on line, unless an error condition is present (for example, the printer is out of paper).

— all margins and tab settings are cleared. Line spacing and character pitch are set to the indicators on the operation panel ; page length is set according to rear switches 2-1, 2-2, and 2-3.

— forward printing is selected. Printing direction (unidirectional or bidirectional) is determined by rear switch 2-8.

— rear switch settings are recorded.

All rear switch settings are described in Appendix C.

ESC CTRL-Z I

Function: Initializes the printer.

Format:

BASIC	CHR$(27) CHR$(26)"I"
Hex	1B 1A 49

Remarks: This command is exactly the same as ESC CTRL-M P (described above) except that it clears printwheel download information.

ESC 3/ESC 4

Function: Selects/cancels graphics mode.

Format:	**ON**	**OFF**
BASIC	CHR$(27) "3"	CHR$(27) "4"
Hex	1B 33	1B 34

Remarks: The graphics mode releases printer control to the host software. In the graphics mode, the print head does not move after characters are printed. Spaces and back space advance the print head horizontally in 1/60 inch increments. Line feeds and negative line feeds move the paper vertically in 1/48 inch increments. The graphics mode is also canceled by a carriage return.

ESC Y

Function: Prints special character 20h.

Format:

BASIC	CHR$(27) "Y"
Hex	1B 59

Remarks: Prints the ESC Y character, which is the hexadecimal character 20h. The actual character printed depends on the printwheel installed.

ESC Z

Function: Prints special character 7Fh.

Format:

BASIC	CHR$(27) "Z"
Hex	1B 5A

Remarks: Prints the ESC Z character, which is the hexadecimal character 7Fh. The actual character printed depends on the printwheel installed.

AUTOMATIC SHEET FEEDER COMMAND

ESC CTRL-Y 1

Function: Inserts a sheet from bin # 1

Format:

BASIC	CHR$(27) CHR$(25) "1"
Hex	1B 19 31

Remarks: When the optional sheet feeder is installed, this command loads single-sheet paper from bin # 1, (If the sheet feeder is not installed, the command is ignored.)

ESC CTRL-Y 2

Function: Inserts a sheet from bin # 2

Formats:

BASIC	CHR$(27)	CHR$(25)	"2"
Hex	1B	19	32

Remarks: When the optional sheet feeder is installed, this command loads single-sheet paper from bin # 2 (If the sheet feeder is not installed, the command is ignored.)

ESC CTRL-Y R

Function: Ejects paper

Format:

BASIC	CHR$(27)	CHR$(25)	"R"
Hex	1B	19	52

Remarks: When the optional sheet feeder is installed, this command ejects single-sheet paper from the printer, without loading a new sheets (If the sheet feeder is not installed, the command is ignored.)

The Premiere 35 provides next four commands which are not supported by the Diablo 630

PRINTWHEEL DOWNLOAD COMMANDS

ESC a e/ ESC a d: Selects/ cacels printwheel download table.

ESC a < HEX$(ascii) HEX$(pos) HEX$(rib) HEX$(ham) HEX$(wid) >
: Defines printwheel download table.

Above three commands are the same as the down load commands of Qume commands. Please refer page 51.

TESTING COMMANDS

ESC CTRL-Z CTRL-N: Selects remote test mode this command is the same as the remote test commands of Qume commands. Please refer page 53.

HyPLOT Vector Plotting

The HyPLOT firmware option enables the Premiere 35 to recognize and execute the ESC and Plot command sequences unique to HyPLOT Vector Plotting. This subsection describes the operation of HyPLOT, and outlines the command sequences which must be supplied by the operator either thru a keyboard or from a host system to produce graphs or vectors.

Definition of Terms

Default - A "built-in" instruction or value for use by the unit in the absence of a user input on the subject.

h - The number of increments of horizontal (X) movement (at 1/120″ each) between print points along the vector line. Minimum value allowed is 0, maximum is 31. See Table 2-1.

Plot Point - The basic X-Y coordinate location identified in the HyPLOT command sequence. Each successive *plot point* establishes the *magnitude* and *direction* for the intervening vector.

Print Point - The individual points along a *vector* where the plot character is printed. Spacing between individual points, called the *precision* or *resolution* of the vector, is determined by the values selected for h and v. Note that the actual print point will be located at the nearest whole increment coincident value of both h and v, and not always exactly on the actual or intended "straight line" of the vector.

Print Position - The position on the paper form directly in front of the print hammer where the next character may be printed.

v - The number of increments of vertical (Y) movement (at 1/48″ each) between print points along the vector line. Minimum value = 0, maximum = 31. See Table 2-1.

Vector - A quantity having both magnitude and direction commonly represented by a directed line segment. In HyPLOT the line segment between successive plot points.

X - Print position (carriage) movement in the horizontal direction (X coordinate), where

+X = Relative movement to the RIGHT (cumulative total cannot exceed the physical limits of the printer – 1620 increments

−X = Relative movement to the LEFT (remainder cannot be less than 0 or beyond the physical limits of the printer)

Absolute moves do not require a sign. The increment count, which is the horizontal print position address, simply increases to the RIGHT and decreases to the LEFT.

Minimum possible increment of horizontal movement = 1/120″.

Y - Print line (paper) movement in the vertical direction (Y coordinate), where

+Y = Relative movement DOWN (paper moves UP for positive line feed – cannot exceed the limits set for either lower margin or 548 increments, will cause a Form Feed)

−Y = Relative movement UP (paper moves DOWN for negative line feed – cannot exceed the TOF or top margin, paper movement will stop)

Absolute moves do not require a sign. The increment count, which is the print line address, simply increases DOWN (paper UP) and decreases UP (paper DOWN).

Minimum possible increment of vertical movement = 1/48″.

Description Of HyPLOT Vector Plotting

HyPLOT action begins with the unit receiving a special pattern of ESC codes to enter HyPLOT mode and establish plot parameters. Once in the HyPLOT mode, the unit's print position can be moved to any (X-Y) plot point coordinate within the current page boundaries as defined by the unit's Printing Format instructions. Each such plot point requires a command sequence of not more than 6 bytes. The actual move from one plot point to the next is accomplished in one of two ways; either directly with no plot character printing along the vector, or by a series of carriage and paper feed moves equal to the values of h (horizontal or X plot precision) and v (vertical or Y plot precision) defined in the HyPLOT Mode command sequence and printing the selected plot character at those print points where whole values of h and v occur near the actual "straight line vector" between the plot points. In short, the unit "fills in" the vector line between plot points by printing the plot character at each point along the line spaced according to the values of h and v.

HyPLOT offers two methods of plotting – ABSOLUTE and RELATIVE, with the only difference being the manner in which each plot point is addressed. In the ABSOLUTE Mode, each plot point is addressed in terms of its X/Y location relative to the page *ORIGIN* (X=0/Y=0). In the RELATIVE Mode, each plot point is addressed in terms of its X/Y displacement from the X/Y location of the preceeding plot point.

X-axis (carriage) movement consists of up to a maximum of 1620 total increments of 1/120″ each (for 132 column paper) *counting to the RIGHT from the ORIGIN*. Y-axis (paper feed) movement consists of up to 528 increments of 1/48″ each (for 11″ long paper) *counting DOWN from the ORIGIN*. Note that the Y-axis increment count *increases* in value with the apparent *downward* movement of the print line, and that X-axis increment count *increases* in value as the carriage is moved *rightward* from the origin. Visualizing the vector plotting situation as it is normally perceived with X-Y coordinates, and remembering that all printer plotting is referenced from the *origin* (the top left corner of the printing format), then vector plotting is always done in the −Y/+X Quadrant, and therefore *ALL* Y values must be inverted. Note also that all vector plotting must be done within the confines of the four *page margins*

(if any) defined by the unit's current Printing Format instructions, and that the unit assumes the 0/0 page origin print position upon entering HyPLOT Mode, with both X and Y position counters at 0.

The HyPLOT Commands

ESC G (27/1B, 71/47)	Enter HyPLOT ABSOLUTE Mode. All vector plot points are interpreted as absolute locations. Movement commands do not require the sign byte. Draw all vectors except the first, which is a move only.
ESC G BEL (27/1B, 71/47, 7/7)	Same as ESC G except draw all vectors including the first one.
ESC V (27/1B, 86/56)	Enter HyPLOT RELATIVE Mode. All vector plot points are interpreted as relative locations. All movement commands must include a sign byte. Draw all vectors except the first, which is a move only.
ESC V BEL (27/1B, 86/56, 7/7)	Same as ESC V except draw all vectors including the first one.
ESC . (character) (27/1B, 46/2E)	Change the vector print character to the selected (character). The default character is the ".".
ESC , h v (27/1B, 44/2C, h, v)	h = horizontal print point resolution or "precision" in increments of 1/120", with a default value of 2. v = vertical print point resolution or "precision" in increments of 1/48", with a default value of 1. Both h and v can be assigned values between 0 and 31 (See Table 2-1). If both h and v = 0 then only the plot points will be drawn (or printed).
ESC 4 (or CR) (27/1B, 52/34)	Exit HyPLOT mode.

Table 2-1
ASCII CHARACTERS FOR VALUES OF h AND v

Value ASCII	Value ASCII
0 = Space	16 = 0
1 = !	17 = 1
2 = "	18 = 2
3 = #	19 = 3
4 = $	20 = 4
5 = %	21 = 5
6 = &	22 = 6
7 = '	23 = 7
8 = (	24 = 8
9 =)	25 = 9
10 = *	26 = :
11 = +	27 = ;
12 = ,	28 = <
13 = -	29 = =
14 = .	30 = >
15 = /	31 = ?

Table 2-2
CONVERSION-X/Y PLOT INCREMENTS OF MOVE TO BINARY EQUIVALENTS

Bit # → / Binary Value	12 / 2048	11 / 1024	10 / 512	9 / 256	8 / 128	7 / 64	6 / 32	5 / 16	4 / 8	3 / 4	2 / 2	1 / 1	PLOT POINT VALUE ↓
X													=
Y													=
	MSB					IB					LSB		

Table 2-3
CONVERSION-X/Y PLOT BINARY EQUIVALENTS TO ASCII BYTE CODE

BYTE	BITS 7	6	5	4	3	2	1	ASCII
1. SIGN	0	1	0	0	0	Y	X	
2. HIY	0	1	5 MSBs of Y					
3. XLOY	1	1	0	2 LSBs of Y		2 LSBs of X		
4. LOY	1	1	5 Intermediate bits of Y					
5. HIX	0	1	5 MSBs of X					
6. LOX	1	0	5 Intermediate bits of X					

Sign Byte : Neg. sign = 1/Pos. sign = 0

Table 2-4
ASCII/BINARY CODE CHART

Bits b_7 →	0	0	0	0	1	1	1	1
b_6 →	0	0	1	1	0	0	1	1
b_5 →	0	1	0	1	0	1	0	1
b_4 b_3 b_2 b_1 ↓ COLUMN → / ROW ↓	0	1	2	3	4	5	6	7
0 0 0 0	0	NUL	DLE	SP	0	@	P	`	p
0 0 0 1	1	SOH	DC1	!	1	A	Q	a	q
0 0 1 0	2	STX	DC2	"	2	B	R	b	r
0 0 1 1	3	ETX	DC3	#	3	C	S	c	s
0 1 0 0	4	EOT	DC4	$	4	D	T	d	t
0 1 0 1	5	ENQ	NAK	%	5	E	U	e	u
0 1 1 0	6	ACK	SYN	&	6	F	V	f	v
0 1 1 1	7	BEL	ETB	'	7	G	W	g	w
1 0 0 0	8	BS	CAN	(	8	H	X	h	x
1 0 0 1	9	HT	EM	)	9	I	Y	i	y
1 0 1 0	10	LF	SUB	*	:	J	Z	j	z
1 0 1 1	11	VT	ESC	+	;	K	[	k	{
1 1 0 0	12	FF	FS	,	<	L	\	l	¦
1 1 0 1	13	CR	GS	-	=	M	]	m	}
1 1 1 0	14	SO	RS	.	>	N	^	n	~
1 1 1 1	15	SI	US	/	?	O	_	o	DEL

Basic HyPLOT Procedure

Following are the step by step procedures used to create the composite ABSOLUTE/RELATIVE Vector Plot Example shown in Figure 2-1. The reader is encouraged to use the forms shown as Tables 2-2, 2-3 and 2-4 as aids in gaining expertise in HyPLOT application. The HyPLOT Worksheet at the end of this subsection includes blank copies of Tables 2-2 and 2-3. The blank worksheet can be copied and used as an aid when formulating the command sequences required to produce a desired plot, as demonstrated in HyPLOT Example A and HyPLOT Example B.

The graph scale shown in Figure 4-1 is 35 character spaces wide x 12/120″ increments per character (10 pitch) = 420/120″ increments. It is 18 line spaces high x 8/48″ increments per line space (6 lines per inch) = 144/48″ increments. The graph scale is located on the page so that the 0/0 scale point ("A") is located at 21 × 12 = 252 increments horizontally (X) and 15 × 8 = 120 increments vertically (+Y) FROM the "x" in the top left corner which defines the 0/0 point or *origin* on the page. The printer assumes the "x" or 0/0 ORIGIN position upon entering the HyPLOT Mode, and the first vector plotting move must always be in a +Y or DOWNWARD direction and a +X direction RIGHT away from the origin. The printer will not execute negative going commands from the 0/0 page starting position.

(1.0) FIRST PLOT — ABSOLUTE MODE

(1.1) Initiate HyPLOT in ABSOLUTE MODE: ESC G
(The first plot is a MOVE ONLY from 0/0 ORIGIN to 0/0 SCALE ("A"))
Set Plot Character to lower case *a*: ESC . a
Set Plot Precision to 4 x default or 8h and 4v: ESC , ($
(Refer to Table 2-1 for ASCII characters)
Set Print in Black: ESC B

The resultant command sequence becomes ESC G ESC . a ESC , ($

(1.2) Send plot command for MOVE ONLY vector to plot point "A"
The required move is 252 increments +X and 120 increments +Y.
This is an ABSOLUTE HyPLOT Vector, therefore the sign byte is not required and the increment count FROM the ORIGIN is the plot point address. The use of the forms in Tables 2-2, 2-3 and 2-4 illustrates the development of the command sequence for plot point "A", which becomes the 5 byte sequence SP ` ~ ! _ (See HyPLOT Example A).

Upon receipt of the last command character (#6 in the required sequence — #1 being ignored) the printer will execute the command and move its print position to vector plot point "A".

(1.3) Following this same procedure, vector commands are developed and sent for plot points "B", "C", "D" and "E". Following the initial no-print MOVE ONLY vector, the printer will print the selected plot character "a" along the vector between the several remaining plot points spaced according to the h and v values selected.

Send commands for vector to plot point 5/5, or "B" (Use HyPLOT Worksheet)
SP ` t "]

Send commands for vector to plot point 7.5/10, or "C" (Use HyPLOT Worksheet)
SP ` j # L

Send commands for vector to plot point 10/3, or "D" (Use HyPLOT Worksheet)
SP ` x # [

Send command for vector to plot point 13.5/7.5, or "E" (Use HyPLOT Worksheet)
SP ` o $ P

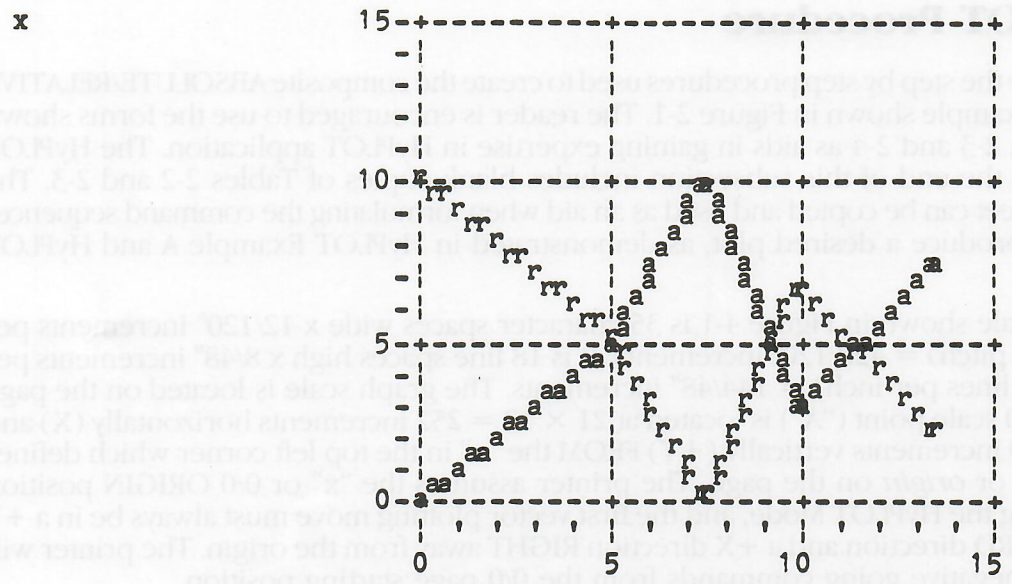


Figure 2-1. ABSOLUTE/ RELATIVE VECTOR PLOT EXAMPLE

It should be noted that in the ABSOLUTE mode, if bytes 2, 3, 4 or 5 do not change from one plot point to the next they need not be sent. Only the changed bytes AND byte 6 need be sent.

(1.4) Exit HyPLOT Mode with a carriage return (CR). ESC 4 also works , but a CR exits HyPLOT and also moves the carriage to the left margin.

(1.5) Send 7 negative line feed commands (ESC *LF*) and 1 negative ½ line feed (ESC D) to return the printer's print position to the 0/0 page ORIGIN position.

(2.0) SECOND PLOT — RELATIVE MODE

(2.1) Initiate HyPLOT in RELATIVE Mode: ESC V
(The first plot is a MOVE ONLY from 0/0 ORIGIN to 0/10 SCALE ("F"))
Set Plot Character to lower case *r*: ESC . r
Set Plot Precision to 4 x default or 8h and 4v: ESC , ($
(Refer to Table 2-1 for ASCII Characters)

The resultant command sequence becomes ESC V ESC . r ESC , ($

(2.2) Send plot command for MOVE ONLY vector to plot point "F".
The required move is 252 increments of +X and 40 increments of +Y.
This is a RELATIVE HyPLOT Vector Plot, and ALL 6 BYTES must be sent for each plot point — including the sign byte. Again, the use of forms in Tables 2-2, 2-3 and 2-4 illustrates the development of the command sequence for plot point "F", which becomes the 6 byte sequence < SP ` j ! _ (See HyPLOT Example B).

Upon receipt of the last command (#6 in the required sequence) the printer will execute the command and move its print position to plot point "F".

(2.3) Following this same procedure, vector commands are developed and sent for plot points "G", "H", "I" and "J". Note that these are RELATIVE moves, and each command includes ONLY the increments of + or −X and + or −Y needed to move to the next plot point. Following the initial no-print MOVE ONLY vector,

the printer will print the selected plot character "r" along the vectors between the several remaining plot points spaced according to the h and v values selected.

Send commands for vector to plot point 5/5, or "G" (Use HyPLOT Worksheet)
SP SP ` j SP ^

Send commands for vector to plot point 7.5/0, or "H" (Use HyPLOT Worksheet)
SP SP ` j SP O

Send commands for vector to plot point 10/7, or "I" (Use HyPLOT Worksheet)
" SP ` m SP O

Send commands for vector to plot point 13.5/2.5, or "J" (Use HyPLOT Worksheet)
SP SP ` i SP U

(2.4) Exit HyPLOT Mode with a carriage return (CR). ESC 4 works, but leaves the carriage in last plot point position. This would require backspaces as well as line feeds to move the print position to the next print line for any follow-on text.

Upon exiting HyPLOT Mode, the printer will "remember" its current print line relative to the T-O-F.

Summary

HyPLOT LIMITS:
Attempts to plot beyond a format margin or mechanical printer limit are not allowed for the following reasons.

+X beyond the right margin — the alarm sounds. Carriage movement printing can continue.
+X beyond 1620 increments — the carriage stops at the mechanical limit. Paper feed and printing can continue.
−X beyond the origin — carriage stops at the left limit. Paper feed and printing can continue.
+Y beyond the lower margin or page end — printer automatically executes a FF to the top margin or TOF for the next page or form.
−Y beyond the origin — ABSOLUTE — the printer does not recognize the sign byte and cannot be commanded to move negatively (up) beyond 0.
−Y beyond the origin — RELATIVE — paper feed down stops at origin or TOF or top margin. Carriage movement and printing continue.

HyPLOT CHARACTER VARIATIONS:
The calculated plot point is always located in the center of the printer's character print space. Use of a "+" or "X" or similar character as the plot character will place the symbol's cross point at the calculated plot point. Use of a "." or a "," or other similar character places the center of the symbol somewhat below the calculated plot point. No set value can be given for this offset since it will vary between type styles and pitch settings. The user will be required to determine this value for the print wheel to be used and include it in when calculating the Y values for plot points.

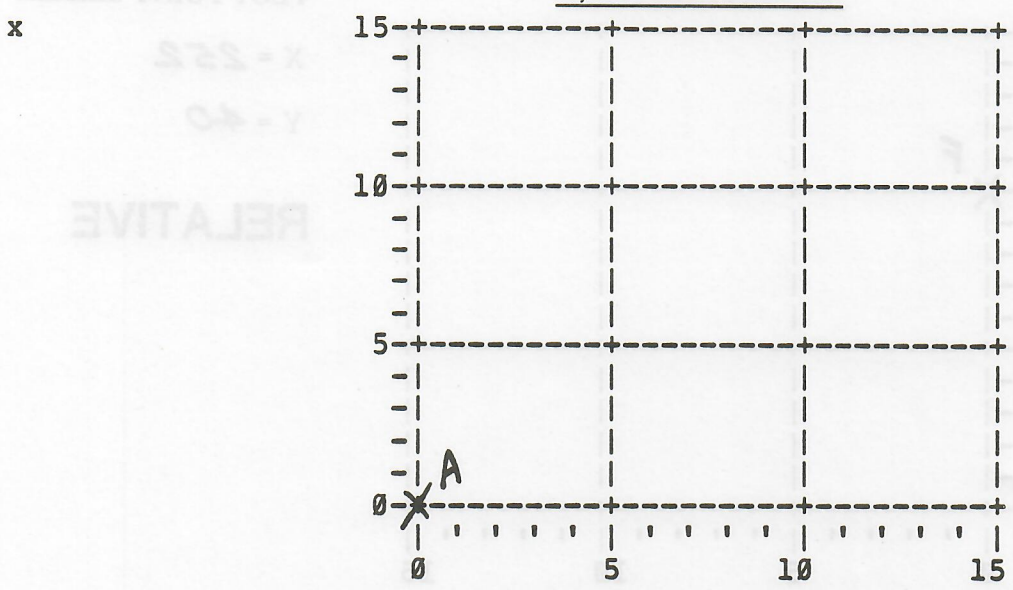
DATA EXCHANGE FORMAT:

The X and Y values for each plot point must be reduced to corresponding incremental values by the host system. The host system must then operate on these values to render them in the required six byte series of HyPLOT commands acceptable to the HyPLOT-equipped Premiere 35 (See Tables 2-3 and 2-4). The Premiere 35 accepts HyPLOT data input in the form of the binary equivalent of ASCII characters making up 7-bit data bytes. The byte sequence given must be followed in either mode, except that in the ABSOLUTE Mode the sign byte is not sent and only those bytes which change from plot point to plot point need be sent — but EACH sequence MUST include the LOX or last (or 6th) byte whether it has changed or not. The printer reads the 6th byte as the execute command for the plot point being transmitted.

THE FULL ASCII COMMAND SEQUENCE FOR THE TWO PLOTS GIVEN:

ESC G ESC . a ESC , ($	=	Set ABSOLUTE HyPLOT Mode & parameters
SP ` ~ ! _	=	Command Plot Point A X=252/Y=120
SP ` t "]	=	Command Plot Point B X=372/Y=80
SP ` j # L	=	Command Plot Point C X=432/Y=40
SP ` x # [	=	Command Plot Point D X=492/Y=96
SP ` o $ P	=	Command Plot Point E X=576/Y=60
ESC CR LF 7 times then ESC D	=	Command Sequence to return Print Position to origin
ESC V ESC . r ESC , ($	=	Set RELATIVE HyPLOT Mode & parameters
< SP ` j ! _	=	Command Plot Point F X=252/Y=+40
SP SP ` j SP ^	=	Command Plot Point G X=120/Y=+40
SP SP ` j SP O	=	Command Plot Point H X=60/Y=+40
" SP ` m SP O	=	Command Plot Point I X=60/Y=−56
SP SP ` i SP U	=	Command Plot Point J X=84/Y=+36
CR	=	Exit HyPLOT Mode

HyPLOT EXAMPLE A



PLOT POINT A

X = 252

Y = 120

ABSOLUTE

TABLE 2-2A
CONVERSION–X/Y PLOT INCREMENTS OF MOVE-TO-BINARY EQUIVALENTS

Bit # → / Binary Value	12 2048	11 1024	10 512	9 256	8 128	7 64	6 32	5 16	4 8	3 4	2 2	1 1	PLOT POINT VALUE ↓
X	0	0	0	0	1	1	1	1	1	1	0	0	= 252
Y	0	0	0	0	0	1	1	1	1	0	0	0	= 120
	MSB					IB					LSB		

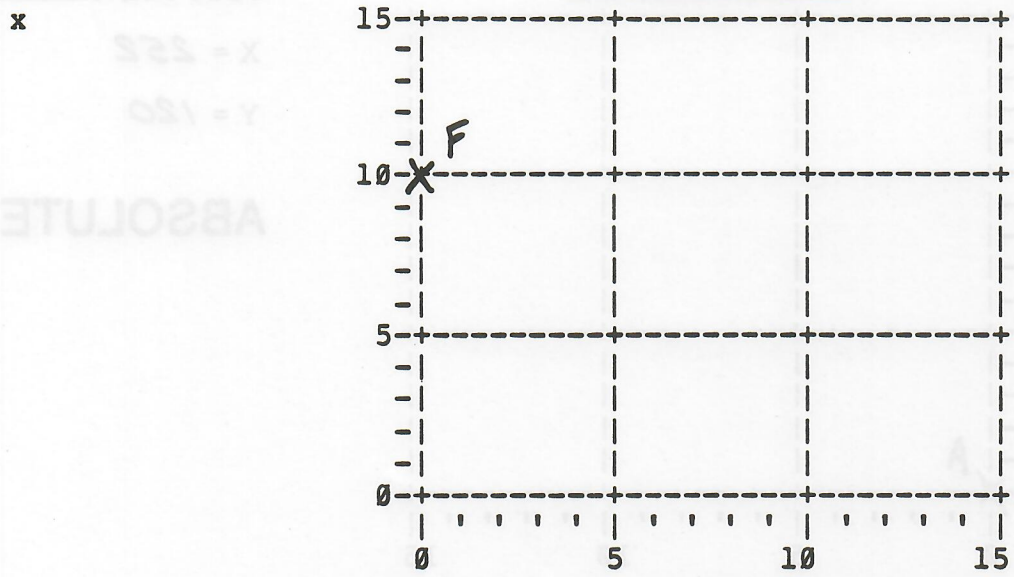
TABLE 2-3A
BINARY TO ASCII

BYTE	BITS 7	6	5	4	3	2	1	ASCII
1. SIGN	0	1	x	x	x	—	—	—
2. HIY	0	1	0	0	0	0	0	SP
3. XLOY	1	1	0	0	0	0	0	`
4. LOY	1	1	1	1	1	1	0	~
5. HIX	0	1	0	0	0	0	1	!
6. LOX	1	0	1	1	1	1	1	_

X = DON'T CARE

COMMAND: SP ` ~ ! _

HyPLOT EXAMPLE B



PLOT POINT F

X = 252

Y = 40

RELATIVE

TABLE 2-2B
CONVERSION-X/Y PLOT INCREMENTS OF MOVE-TO-BINARY EQUIVALENTS

Bit # → / Binary Value	12 2048	11 1024	10 512	9 256	8 128	7 64	6 32	5 16	4 8	3 4	2 2	1 1	PLOT POINT VALUE ↓
X	0	0	0	0	1	1	1	1	1	1	0	0	= 252
Y	0	0	0	0	0	0	1	0	1	0	0	0	= 40
	MSB					IB					LSB		

TABLE 2-3B
BINARY TO ASCII

BYTE	BITS 7	6	5	4	3	2	1	ASCII
1. SIGN	0	1	x	x	x	0	0	<
2. HIY	0	1	0	0	0	0	0	SP
3. XLOY	1	1	0	0	0	0	0	`
4. LOY	1	1	0	1	0	1	0	j
5. HIX	0	1	0	0	0	0	1	!
6. LOX	1	0	1	1	1	1	1	—

X = DON'T CARE

COMMAND: < SP ` j ! —

HyPLOT WORKSHEET

(Reproduce as needed)

PLOT POINT _____

X = _____

Y = _____

User should make use of a grid scale which matches the intended vector plot.

TABLE 2-2C
CONVERSION-X/Y PLOT INCREMENTS OF MOVE-TO-BINARY EQUIVALENTS

Bit # →	12	11	10	9	8	7	6	5	4	3	2	1	PLOT POINT VALUE ↓
Binary Value	2048	1024	512	256	128	64	32	16	8	4	2	1	
X													=
Y													=
	MSB					IB					LSB		

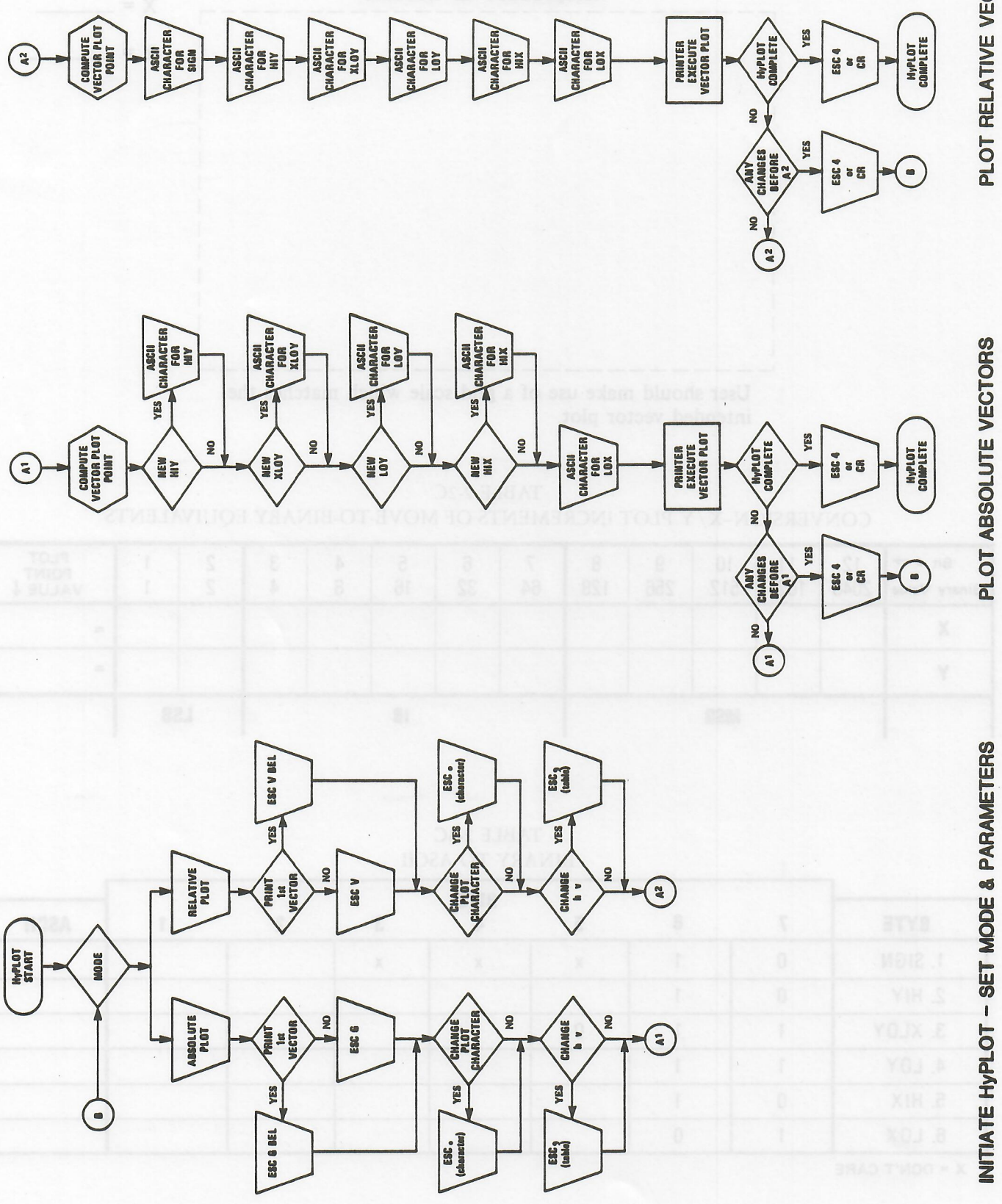
TABLE 2-3C
BINARY TO ASCII

BYTE	BITS 7	6	5	4	3	2	1	ASCII
1. SIGN	0	1	x	x	x			
2. HIY	0	1						
3. XLOY	1	1	0					
4. LOY	1	1						
5. HIX	0	1						
6. LOX	1	0						

X = DON'T CARE

COMMAND: _____

Figure 2-2
HyPLOT FLOWCHART



Chapter 3
Qume Command Descriptions

This chapter describes the commands used when the Qume Sprint 11 option is selected. Rear switches 3-1 and 3-2 must be set to the ON position at power up (see Appendix C for details).

PRINT STYLE COMMANDS

ESC US CHR$ (n) (n = 1 to 126)

Function: Sets the character pitch (HMI) to (n-1)/120 inch.

Format:

BASIC	CHR$(27) CHR$(31) CHR$(n)	
Hex	1B 1F nh	(nh = 01h to 7Eh)

Remarks: Character pitch is also referred to as the Horizontal Motion Index, or HMI. The HMI is determined in (n-1)/120 inch increments, where the value of n can range from 1 to 126. For example, to select pica pitch, use n = 13 (13-1 = 12/120 inch, or 10 characters per inch).

ESC E HEX$ (n1) HEX$(n2)

Function: Set a variable character pitch (HMI) in 1/120 inch increments specified by n1 and n2.

Format:

BASIC	CHR$(27) "E" HEX$(n1) HEX$(n2)
Hex	1B 45 n1h n2h

Remarks: Sets the character pitch (HMI) in 1/120 inch increments, where n1 and n2 are decimal values (n1 is the tens and n2 is the ones), expressed in their hexadecimal equivalents. To determine the values of n1 and n2, use the following formulas (where X is the horizontal distance you want to move):

n1 = X \ 10 (\ is integer division)
n2 = X mod 10

For example, if the horizontal distance is 24/120 inch, n1 and n2 are determined as follows:

n1 = 24 \ 10 = 2
n2 = 24 mod 10 = 4

The hex equivalent of the decimal 2 is 2, and of 4 is 4. The complete sequence of four ASCII characters to send to the printer is: ESC E 2 4.

Horizontal distance can range from 0/120 to 159/120 inches. When the HMI is 99/120 inch or less, hex conversion is not necessary because 0 to 9 is the same in hex or decimal. Invalid parameters are ignored.

ESC H HEX$(n1) HEX$(n2) HEX$(n3)

Function: Moves the print head relative to its current location the distance specified by n1, n2, and n3.

Format:

BASIC	CHR$(27) "H" HEX$(n1) HEX$(n2) HEX$(n3)
Hex	1B 48 n1h n2h n3h

Remarks: Moves the print head from its present location a distance (in increments of 1/120 inch) and direction specified by n1, n2 and n3. The motion can range from 0/120 inch to 1584/120 inch (commands which would cause the print head to move beyond the platen limits are ignored).

To determine the values of n1, n2 and n3, use the following formulas (where X is the horizontal distance you want to move):

n1 is the hexadecimal representation of X \ 256, plus 40h (to move the right) or 50h (to move to the left).

n2 is the hexadecimal representation of (X mod 256) \ 16, plus 40h.

n3 is the hexadecimal representation of X mod 16, plus 40h.

For example, to move the print head 4.5 inches to the left (which is 540/120 inch), n1, n2, and n3 are calculated as follows:

n1 is 540 \ 256, or 2 (which is also 02h), plus 50h, for a total of 52h. By checking the ASCII code chart in Appendix B, you'll see that 52h is the code for R.

n2 is (540 mod 256) \ 16, which is 1 or 01h, plus 40h, for a total of 41h. 41h is the ASCII code for A.

n3 is 540 mod 16, which is 12 (or 0Ch), plus 40h, for a total of 4Ch. 4Ch is the ASCII code for L.

The complete command consists of five characters: ESC H R A L.

ESC $/ESC %

Function: Selects/cancels proportional print.

Format:	**ON**	**OFF**
BASIC	CHR$(27) "$"	CHR$(27) "%"
Hex	1B 24	1B 25

Remarks: Proportional spacing varies the space between characters depending on their width. For example, an "M" is wider than an "I". (With fixed spacing, all characters and spaces are the same width.) A proportional print wheel must be installed to use this feature.

Printing is returned to the previous character pitch selected when you can cancel proportional print.

In some cases, commercial software controls the proportional spacing which overrides ESC $ and ESC %.

ESC I/ESC J

Function: Selects/cancels auto underscore.

Format:	**ON**	**OFF**
BASIC	CHR$(27) "I"	CHR$(27) "J"
Hex	1B 49	1B 4A

Remarks: This command causes all characters and spaces to be underscored from the point underscoring is selected to the point it is canceled. All spaces and horizontal space that is tabbed over is underscored. Underscoring is also canceled by a form feed (FF) code CHR$(12).

ESC K CHR$(n)/ESC M (n = 1 to 4)

Function: Selects/cancels bold print.

Format:	**ON**	**OFF**
BASIC	CHR$(27) "K" CHR$(n)	CHR$(27) "M"
Hex	1B 4B nh (n = 31h to 34h)	1B 4D

Remarks: With bold print, each character is printed (with no horizontal or vertical offset) the number of times selected by the value of n, where n is the character 1, 2, 3, or 4. For example, n = 2 can be expressed as the character "2", as ASCII decimal 50, or as 31 hexadecimal.

When n = 1, characters are printed the same as normal (single-strike) characters. Therefore, bold print can be canceled by using ESC K, with n = 1, or by using ESC M.

Bold and shadow print can be combined for even darker characters.

ESC Q/ESC R

Function: Selects/cancels shadow print.

Format:	**ON**	**OFF**
BASIC	CHR$(27) "Q"	CHR$(27) "R"
Hex	1B 51	1B 52

Remarks: With shadow print, each character is printed once, then printed again offset horizontally 1/120 inch. Shadow and bold print can be combined for even darker characters.

LINE SPACING COMMANDS

CTRL-M (Carriage Return)
(also RETURN or ENTER)

Function: Returns the print head to the left margin after printing.

Format:

BASIC	CHR$(13)
Hex	0D

Remarks: A carriage return moves the print head to the left margin, but does not advance the paper to the next line. Therefore, many computers automatically add a line feed (CTRL-J or ASCII 10) to each carriage return.

If your computer does not automatically add line feeds, you can turn rear switch 2-4 ON (see Appendix C), or use ESC, command.

CTRL-J (Line Feed)

Function: The line feed advances the paper to the next line after printing.

Format:

BASIC	CHR$(10)
Hex	0A

Remarks: The distance the paper is advanced is determined by the current line spacing (VMI) set by ESC RS, or ESC L. Many computers automatically add a line feed to each carriage return. If yours does not, you can turn rear switch 2-4 ON (see Appendix C), or use ESC,.

ESC CTRL-J

Function: Negative (reverse) line feed.

Format:

BASIC	CHR$(27) CHR$(10)
Hex	1B 0A

Remarks: A reverse line feed moves the paper down one line of the current line spacing, thus moving the printing position back toward the top of the page. Line spacing (VMI) is set with ESC RS or ESC L.

ESC U

Function: Half line feed.

Format:

BASIC	CHR$(27) "U"
Hex	1B 55

Remarks: A half line feed moves the paper one half line of the current line spacing. Line spacing (VMI) is set with ESC RS or ESC L. You can use ESC U in combination with ESC D to print superscripts and subscripts.

ESC D

Function: Negative (reverse) half line feed.

Format:

BASIC	CHR$(27) "D"
Hex	1B 44

Remarks: A reverse half line feed moves the paper down one half line of the current line spacing, thus moving the printing position back toward the top of the page. Line spacing (VMI) is set with ESC RS or ESC L. You can use ESC D in combination with ESC U to print superscripts and subscripts.

ESC W/ESC Z

Function: Selects/cancels automatic carriage return.

Format:	**ON**	**OFF**
BASIC	CHR$(27) "W"	CHR$(27) "Z"
Hex	1B 57	1B 5A

Remarks: The automatic carriage return causes a carriage return and line feed when the print head reaches the right margin, which is either the default right margin (column 136 in 10 pitch) or the right margin set by ESC 0. (With this option turned off, the print head will move to the extreme right until the computer sends a carriage return).

The printer does not perform a word wrap function at the right margin. It prints the characters that fit and then continues printing on the next line, even if it breaks a word in the middle.

A line feed is included regardless of whether the automatic line feed option is selected.

ESC ,/ESC .

Function: Selects/cancels automatic line feed.

Format:	**ON**	**OFF**
BASIC	CHR$(27) ","	CHR$(27) "."
Hex	1B 2C	1B 2E

Remarks: Selecting this feature automatically adds a line feed to a carriage return (CR). It can be used when your computer does not add line feeds for you. You can select the automatic line feed option as the power on default by turning rear switch 2-4 ON (see Appendix C).

ESC RS CHR$(n) (n = 1 to 126)

Function: Sets the line spacing (VMI) to (n-1)/48 inch.

Format:

BASIC	CHR$(27) CHR$(30) CHR$(n)	
Hex	1B 1E nh	(nh = 01h to 7Eh)

Remarks: This command sets the line spacing for subsequent line feeds. Line spacing is also referred to as the Vertical Motion Index, or VMI. The VMI is determined in (n-1)/48 inch increments, where the value of n can range from 1 to 126.

ESC L HEX$(n1) HEX$(n2)

Function: Sets a variable line spacing (VMI) in 1/48 inch increments specified by n1 and n2.

Format:

BASIC	CHR$(27) "L" HEX$(n1) HEX$(n2)
Hex	1B 4C n1h n2h

Remarks: Sets the line spacing (VMI) in 1/48 inch increments, where n1 and n2 are decimal values (n1 is the tens and n2 is the ones), expressed in their hexadecimal equivalents. To determine the values of n1 and n2, use the following formulas (where X is the vertical distance you want to move):

n1 = X \ 10 (\ is integer division)
n2 = X mod 10

For example, to set the vertical distance is 2.5 inches, or 120/48 inches, n1 and n2 are determined as follows:

n1 = 120 \ 10 = 12
n2 = 120 mod 10 = 0

The hex equivalent of the decimal 12 is C, and of 0 is 0. The complete sequence of four ASCII characters to send to the printer is: ESC L C 0.

Vertical distance can range from 0/48 to 159/48 inches. When the VMI is 99/48 inches or less, hex conversion is not necessary because 0 to 9 is the same in hex or decimal. Invalid parameters are ignored.

ESC V HEX$(n1) HEX$(n2) HEX$(n3)

Function: Moves the paper relative to the current location the distance specified by n1, n2, and n3.

Format:

BASIC	CHR$(27) "V" HEX$(n1) HEX$(n2) HEX$(n3)
Hex	1B 56 n1h n2h n3h

Remarks: Moves the paper from its present location a distance (in increments of 1/48 inch) and direction specified by n1, n2 and n3. The motion can range from 0/48 inch to 1791/48 inch.

To determine the values of n1, n2 and n3, use the following formulas (where X is the vertical distance you want to move):

n1 is the hexadecimal representation of X \ 256, plus 40h (to move up) or 50h (to move down).

n2 is the hexadecimal representation of (X mod 256) \ 16, plus 40h.

n3 is the hexadecimal representation of X mod 16, plus 40h.

For example, to move the paper up 4.5 inches (which is 216/48 inch), this is how to calculate n1, n2, and n3:

n1 is 216 \ 256, or 0 (which is also 00h), plus 40h, for a total of 40h. By checking the ASCII code chart in Appendix B, you'll see that 40h is the code for @.

n2 is (216 mod 256) \ 16, which is 13 or 0Dh, plus 40h, for a total of 4Dh. 4Dh is the ASCII code for M.

n3 is 216 mod 16, which is 8 (or 08h), plus 40h, for a total of 48h. 48h is the ASCII code for H.

The complete command consists of five characters: ESC V @ M H.

PAGE DESIGN COMMANDS

CTR-L (Form Feed)

Function: Advances the paper to the top of the next page, either to the top of form or the current top margin.

Format:

BASIC	CHR$(12)
Hex	0C

Remarks: The top margin is set with ESC +. The top of form, or TOF, is set by the position of the paper when:

— the printer is turned on.

— when the control panel TOP OF FORM button is pressed.

— when the printer is initialized (ESC CR P or ESC SUB I).

— when the page length is set with ESC F.

— when the paper is inserted by operation of the paper bail.

ESC F HEX$(n1) HEX$(n2)

Function: Sets the page length specified by n1 and n2.

Format:

BASIC	CHR$(27) "F" HEX$(n1) HEX$(n2)
Hex	1B 46 n1h n2h

Remarks: Sets the length of the page in vertical increments of 1/6 inch, where n1 and n2 are decimal values (n1 is the tens and n2 is the ones), expressed in their hexadecimal equivalent. To determine the values of n1 and n2, use the following formulas (where X is the page length):

n1 = X \ 10 (\ is integer division)
n2 = X mod 10

For example, to set the page length to 14 inches, or 84/6 inches, n1 and n2 are determined as follows:

n1 = 84 \ 10 = 8
n2 = 84 mod 10 = 4

The hex equivalent of the decimal 8 is 8, and of 4 is 4. The complete sequence of four ASCII characters to send to the printer is: ESC F 8 4.

The page length can range from 1/6 inch to 127/6 inches. When the page length is 99/6 inches or less, hex conversion is not necessary because 0 to 9 is the same in hex or decimal. Invalid parameters are ignored.

ESC 9

Function: Sets the left margin.

Format:

BASIC	CHR$(27) "9"
Hex	1B 39

Remarks: Sets the left margin at the current print head postion. Before this command is used, the print head must be moved left or right, to the column position where you want the margin to be set.

ESC 0

Function: Sets the right margin.

Format:

BASIC	CHR$(27) "0"
Hex	1B 30

Remarks: Sets the right margin at the current print head position. Before this command is used, the print head must be moved left or right, to the column position where you want the margin to be set.

ESC O/ESC Y

Function: Selects/cancels right margin control.

Format:	**ON**	**OFF**
BASIC	CHR$(27) "O"	CHR$(27) "Y"
Hex	1B 4F	1B 59

Remarks: The right margin control acts similar to a word wrap function. The right margin is either the default margin (column 136 in 10 pitch) or the right margin set by ESC 0.

A carriage return and line feed is inserted whenever the printer finds a space within the five columns preceding the right margin. If a space is not found, printing continues past the right margin until a space is found or until it reaches the end of the platen.

A line feed is included regardless of whether the automatic line feed option is selected.

ESC +

Function: Sets the top margin at the current paper position.

Format:

BASIC	CHR$(27) "+"
Hex	1B 2B

Remarks: Before this command is used, the paper must be moved up or down, to the line where you want the margin to be set. The top margin is changed to the top of form (the current paper position) when you set the page length with ESC F, or when you initialize the printer.

ESC -

Function: Sets the bottom margin at the current paper position.

Format:

BASIC	CHR$(27) "-"
Hex	1B 2D

Remarks: Before this command is used, the paper must be moved up or down, to the line where you want the margin to be set. The bottom margin is cleared when you set the page length with ESC F, or when you initialize the printer.

HORIZONTAL MOTION COMMANDS

CTRL-H

Function: Moves the print head left one character to overprint.

Format:

BASIC	CHR$(8)
Hex	08

Remarks: The print head can be moved to the extreme left side as far as the left margin with multiple back spaces.

ESC N

Function: Disables print head movement for one character.

Format:

BASIC	CHR$(27) "N"
Hex	1B 4E

Remarks: This feature is used to overstrike characters and is similar to a backspace. The print head does not move after it prints the character immediately following the ESC N command. Therefore, the second character is printed directly over the first. (A backspace prints the first character with regular print head movement, then moves the print head left to overstrike the first character.)

ESC CTRL-H

Function: Moves the print head 1/120 inch to the left.

Format:

BASIC	CHR$(27) CHR$(8)
Hex	1B 08

Remarks: This command is used when very fine backspacing is required. Each time the command is received, the print head moves to the left 1/120 inch.

ESC >

Function: Selects unidirectional printing.

Format:

BASIC	CHR$(27) ">"
Hex	1B 3E

Remarks: This command causes each line to be printed from left to right, allowing very fine vertical alignment between lines (for columns, grids, and so on). Unidirectional printing can be set as the power on default by turning rear switch 2-8 ON. Unidirectional printing is canceled by ESC < which selects bidirectional printing.

ESC <

Function: Selects bidirectional printing.

Format:

BASIC	CHR$(27) "<"
Hex	1B 3C

Remarks: Bidirectional printing maximizes printing speed. Bidirectional printing can be set as the power on default by turning rear switch 2-8 OFF. Bidirectional printing is canceled by ESC > which selects unidirectional printing.

ESC 6/ESC 5

Function: Selects/cancels backward printing.

Format:	**ON**	**OFF**
BASIC	CHR$(27) "6"	CHR$(27) "5"
Hex	1B 36	1B 35

Remarks: Backward printing prints lines from right-to-left rather than left-to-right (as with forward printing). Spaces are reversed, however, tab settings, carriage returns, and paper movement are not affected. A carriage return (CR) also cancels backward printing.

TAB COMMANDS

CTRL-I (Horizontal Tab)

Function: Moves the print head to the next horizontal tab setting.

Format:

BASIC	CHR$(9)
Hex	09

Remarks: A horizontal tab moves the print head to the right to the next horizontal tab position set by ESC 1. Horizontal tab settings are column-dependent, that is the tab position changes on the paper according to the change in character pitch. At power on, there are no tab settingfs; a horizontal tab moves the print head to the extreme right.

ESC 1

Function: Sets a horizontal tab at the current print head position.

Format:

BASIC	CHR$(27) "1"
Hex	1B 31

Remarks: Before this command is used, the print head must be moved left or right, to the column position where you want the horizontal tab to be set. Up to 100 horizontal tab positions can be set. Because they are stored as column numbers, the position of tab settings change with subsequent changes in character pitch (HMI).

ESC 8

Function: Clears a horizontal tab at the current print head position.

Format:

BASIC	CHR$(27) "8"
Hex	1B 38

Remarks: Before this command is used, the print head must be moved left or right, to the column position where you want the horizontal tab to be cleared.

ESC 2

Function: Clears all horizontal tabs.

Format:

BASIC	CHR$(27) "2"
Hex	1B 32

Remarks: Clears all the horizontal tab positions set by ESC 1. (If you wish to clear individual horizontal tab positions, use ESC 8).

ESC CTRL-I CHR$(n) (n = 1 to 126)

Function: Absolute horizontal tab to column n-1.

Format:

BASIC	CHR$(27) CHR$(9) CHR$(n)	
Hex	1B 09 n	(nh = 01h to 7Eh)

Remarks: This command moves print head horizontally, either left or right, to column n-1 of the current character pitch (HMI). The leftmost print position is column 0. The value of n can range from 1 to 126. In case of 7-bit selection (SW-2-7 : OFF) , If n is greater than 128, then 128 is subtracted from n, resulting in a column value between 1 and 126. If n is 0, 127, 128, or 255, the command is ignored.

ESC C HEX$(n1) HEX$(n2)

Function: Absolute horizontal tab to a column specified by n1 and n2.

Format:

BASIC	CHR$(27) "C" HEX$(n1) HEX$(n2)
Hex	1B 43 n1h n2h

Remarks: Moves the printhead to a specified column of the current character pitch (HMI). The leftmost print position is column 0. n1 and n2 are decimal values (n1 is the tens and n2 is the ones), expressed in their hexadecimal equivalents. To determine the values of n1 and n2 , use the following formulas (where X is the column number you want to move to):

n1 = X \ 10 (\ is integer division)
n2 = X mod 10

For example, if the column number is 58, n1 and n2 are determined as follows:

n1 = 58 \ 10 = 5
n2 = 58 mod 10 = 8

The hex equivalent of the decimal 5 is 5, and of 8 is 8. The complete sequence of four ASCII characters to send to the printer is: ESC C 5 8.

The column number you can move to can range from 0 to 159. When the column number is 0 to 99, hex conversion is not necessary is not necessary because 0 to 9 is the same in hex or decimal.

ESC (HEX$(d1) HEX$(d2), HEX$(d1) HEX$(d2),...HEX$(d1n) HEX$(d2n).

Function: Sets multiple horizontal tab positions.

Format:

BASIC	CHR$(27) "(" HEX$(d1) HEX$(d2) "," HEX$(d1) HEX$(d2) ","...Hex$(d1n) HEX$(d2n) " "
Hex	1B 28 d1h d2h 2C d1h d2h 2C...d1nh d2nh 2E

Remarks: Sets multiple horizontal tab positions, where for each tab position, d1 and d2 are decimal values (d1 is the tens and d2 is the ones), expressed in their hexadecimal equivalents. Each tab position must be followed by an ASCII comma (,), and the last position followed by an ASCII period (.). Horizontal tab positions can be listed in any order.

To determine the value of d1 and d2, use the following formulas (where X is the column where you want to set the tab position):

d1 = X \ 10 (\ is integer division)
d2 = X mod 10

For example, if you want to set a horizontal tab position at column 23, d1 and d2 are determined as follows:

d1 = 23 \ 10 = 2
d2 = 23 mod 10 = 3

The hex equivalent of the decimal 2 is 2, and of 3 is 3. The complete sequence of five ASCII characters to send to the printer is: ESC (2 3. (period).

You can set up to 159 horizontal tab positions. When the column number is 0 to 99, hex conversion is not necessary because 0 to 9 is same in hex or decimal. Invalid parameters are ignored.

This example sets horizontal tab posittions at columns more than one column:

Columns:	08	62	77	114	120
Hex values:	08	62	77	B4	C0

The command to send to the printer would be:

ESC (08, 62, 77, B4, C0.

and the BASIC statement:

LPRINT CHR$(27) "(08, 62, 77, B4, C0."

ESC) HEX$(d1) HEX$(d2), HEX$(d1) HEX$(d2),...HEX$(d1n) HEX$(d2n).

Function: Clears multiple horizontal tab positions.

Format:

BASIC	CHR$(27) "(" HEX$(d1) HEX$(d2) "," HEX$(d1) HEX$(d2) ","...HEX$(d1n) HEX$(d2n) "."
Hex	1B 29 d1h d2h 2C d1h d2h 2C...d1nh d2nh 2E

Remarks: Clears multiple horizontal tab positions, where for each tab postion, d1 and d2 are decimal values (d1 is the tens and d2 is the ones), expressed in their hexadecimal equivalents. Each tab positon must be followed by an ASCII comma (,), and the last value follwed by an ASCII period (.). Horizontal tab positions can be listed in any order.

The values of d1 and d2 are determined and sent to the printer in the same manner as described in ESC (.

For example, if you send these two BASIC statements:

```
LPRINT CHR$(27) "(05, 43, 79, A4, A9."
LPRINT CHR$(27) ")43, A4."
```

The first statement sets horizontal tab positions at columns 5,43, 79, 104, and 109, while the second statement clears the tab positions at columns 43 and 104. Tab positions at columns 5, 79, and 109 remain unchanged.

ESC CTRL-K CHR$(n) (n = 1 to 126)

Function: Absolute vertical tab to line n-1.

Format:

BASIC	CHR$(27) CHR$(11) CHR$(n)	
Hex	1B 0B nh	(nh = 01h to 7Eh)

Remarks: This command moves print head vertically, either up or down, to line n-1 of the current line spacing (VMI). The top of form postion is line 0. The value of n can range from 1 to 126. In case of 7-bit selection (sw-2-7: OFF), if n is greater than 128, then 128 is subtracted from n, resulting in a column value between 1 and 126. If n is 0, 127, 128, or 255, the command is ignored.

ESC P HEX$(n1) HEX$(n2)

Function: Absolute vertical tab to a line specified by n1 and n2.

Format:

BASIC	CHR$(27) "P" HEX$(n1) HEX$(n2)
Hex	1B 50 n1h n2h

Remarks: Moves the paper to a specified line of the current line spacing (VMI). The top of form position is line 0. n1 and n2 are decimal values (n1 is the tens and n2 is the ones), expressed in their hexadecimal equivalents. To determine the values of n1 and n2, use the following formulas (where X is the line number you want to move to):

n1 = X \ 10 (\ is integer division)
n2 = X mod 10

For example, if the line number is 115, n1 and n2 are determined as follows:

n1 = 115 \ 10 = 11
n2 = 115 mod 10 = 5

The hex equivalent of the decimal 11 is B, and of 5 is 5. The complete sequence of four ASCII characters to send to the printer is: ESC P B 5.

The line number you can move to can range from 0 to 127. When the line number is 0 to 99, hex conversion is not necessary because 0 to 9 is the same in hex or decimal.

GRAPHICS AND PROGRAM MODE COMMANDS

ESC 3/ESC 4

Function: Selects/cancels graphics mode (1/60 inch HMI; 1/48 inch VMI).

Format:	**ON**	**OFF**
BASIC	CHR$(27) "3"	CHR$(27) "4"
Hex	1B 33	1B 34

Remarks: In the graphics mode, the print head does not move after characters are printed. Spaces advance the print head horizontally in 1/60 inch increments; back spaces move the print head to the left. Line feeds and negative line feeds the paper vertically in 1/48 inch increments. The graphics mode is also canceled by a carriage return.

ESC G/ESC 4

Function: Selects/cancels graphics mode (1/120 inch HMI; 1/48 inch VMI).

Format:	**ON**	**OFF**
BASIC	CHR$(27) "G"	CHR$(27) "4"
Hex	1B 47	1B 34

Remarks: This graphics command acts the same as ESC 3 except spaces and backspaces move the print head horizontally in 1/120 inch (instead of 1/60 inch) increments. Line feeds and negative line feeds move the paper vertically in 1/48 inch increments. The graphics mode is also canceled by a carriage return.

ESC CTRL-N/ESC CTRL-O

Function: Selects/cancels program mode.

Format:	**ON**	**OFF**
BASIC	CHR$(27) CHR$(14)	CHR$(27) CHR$(15)
Hex	1B 0E	1B 0F

Remarks: The program mode enables the use of special printwheels by defining individual spoke positions. It also lets you adjust print quality vs. ribbon economy to your specific needs by controlling the hammer intensity, horizontal movement.

Table 3-1 shows the ASCII character to send for each combination of hammer intensity, horizontal movement, and ribbon advance.

Table 3-1 Program mode ASCII character

		Hammer Energy									
		0	1	2	3	4	5	6	7		
C	0	NUL	DLE	SP	0	@	P	‘	p	2	R
A	1	SOH	DC1	!	1	A	Q	a	q	2	I
R	2	STX	DC2	”	2	B	R	b	r	2	B
R	3	ETX	DC3	#	3	C	S	c	s	2	B
I	4	EOT	DC4	$	4	D	T	d	t	2	O
A	5	ENQ	NAK	%	5	E	U	e	u	2	N
G	6	ACK	SYN	&	6	F	V	f	v	2	
E	7	BEL	ETB	’	7	G	W	g	w	3	A
	8	BS	CAN	(	8	H	X	h	x	3	D
M	9	HT	EM	)	9	I	Y	i	y	3	V
O	10	LF	SUB	*	:	J	Z	j	z	3	A
T	11	VT	ESC	+	;	K	[	k	{	4	N
I	12	FF	FS	,	<	L	\	l	|	4	C
O	13	CR	GS	-	=	M	]	m	}	4	E
N	14	SO	RS	.	>	N	^	n	~	5	
	15	SI	US	/	?	O	_	o	DEL	5	

NOTE: NUL and DEL are not valid characters. Carriage motion is in 1/120 inch increments. Ribbon feed can only be programmed in the secondary program mode.

Hammer intensity. Intensities range from 0 to 7.

Horizontal movement/ribbon advance. Distance can be from 0/120 inch to 15/120 inch. Ribbon advance is directly related to the amount of horizontal movement and is not independently selected in the program mode. (The secondary program mode selected by ESC # can be used to control ribbon advance.)

To send a printwheel definition to the printer, first enter the program mode by sending ESC CTRL-N. Then, for each character to be defined, send the ASCII code for the character followed by the appropriate character from Table 3-1 for the desired hammer intensity and carriage spacing this two character sequence for as many characters as necessary, and then use the ESC CTRL-O command to leave the program mode.

ESC #/ESC CTRL-O

Function: Selects/cancels secondary program mode.

Format:	**ON**	**OFF**
BASIC	CHR$(27) "#"	CHR$(27) CHR$(15)
Hex	1B 23	1B 0F

Remarks: Secondary program mode is similar to the program mode described above except that ribbon movement can be programmed independently. The ribbon advance can be selected from a minimum relative increment of 2 to a maximum of 5.

To use secondary program mode, you must first enter program mode with the ESC CTRL-N command. Then send ESC # to enter secondary program mode. For each character to be defined, send the ASCII code of the character followed by the appropriate character from Table 3-1 for the desired hammer intensity and ribbon advance (note that for each hammer intensity, there are several characters that will result in the same ribbon advance, it doesn't matter which character you use). After defining all the necessary characters, leave program mode with ESC CTRL-O.

US CHR$(n)

Function: Selects program mode carriage motion.

Format:	
BASIC	CHR$(31) CHR$(n)
Hex	1F nh

Remarks: This command causes the carriage to move either left or right between 1/120″ and 63/120″. n is distance in 1/120 inch for RIGHT movement; for movement to the left n is the distance to be moved plus 64 (decimal).

PRINTWHEEL DOWNLOAD COMMANDS

ESC ae/ESC ad

Function: Selects/cancels print wheel download table.

Format:	**ON**	**OFF**
BASIC	CHR$(27) "ae"	CHR$(27) "ad"
Hex	1B 61 65	1B 61 64

Remarks: Most printwheels have all the characters arranged in the same sequence so that the Premiere 35 knows where to find a particular character, how hard to fire the hammer, how far to advance the ribbon, and how far to move the print head (for proportionally spaced wheels). All of this information is stored in the printer's permanent memory. The Premiere 35 has printwheel information for several different standard types of printwheels. The appropriate information for a given printwheel can be selected with rear switches 3-3 and 3-4.

There are some non-standard printwheels (particularly for foreign language and graphics applications) that don't have pre-stored information in the printer. The Premiere 35 still allows their use, however, through the use of download tables. To use a download table for a special wheel, it must first be defined with the ESC a <data> command (described below). Then, to use that table instead of the switch-selected default table, send ESC ae. To cancel use of the table (thereby returning to the standard printwheel tables), send ESC ad.

ESC a < HEX$(ascii) HEX$(pos) HEX$(rib) HEX$(ham) HEX$(wid) >

Function: Defines print wheel download table.

Format:

BASIC	CHR$(27) "a<" HEX$(ascii) HEX$(pos) HEX$(rib) HEX$(ham) HEX$(wid) ">"
Hex	1B 61 3C (ascii)h (pos)h (rib)h (ham)h (wid)h 3E

Remarks: This command allows a printwheel information table (or partial table) to be downloaded to the printer. For each printwheel character, five pieces of information are required: ASCII character code, printwheel spoke position, ribbon advance, hammer intensity, and character width. Each sequence of five values (defining one character) is separated by a comma. The size and legal ranges of each of the five values are as follows:

ASCII code	2 bytes	20h to 7Fh
Spoke position	2 bytes	00h to 5Fh
Ribbon advance	1 byte	3h to 7h
Hammer intensity	1 byte	0h to 7h
Character width	2 bytes	00h to 0Fh

As an example, suppose the first character to be defined is ASCII code 42h, which is at spoke position 14h, has a ribbon advance of 5, a hammer intensity of 4, and a character width of 7. The command to download this character would be ESC a < 42145407_o>. If you wanted to define more characters with the same command, insert the next group of eight hexadecimal digits and a comma before the > symbol.

The information for a printwheel can be obtained from the printwheel supplier or manufacturer.

Particularly when downloading a complete table (involving a rather long string of characters), you may want to send a checksum at the end of the string to confirm that you typed it correctly and that it was transmitted correctly to the printer. To use this optional feature, the last data is inserted by a colon, followed by a two digit checksum. The checksum is calculated by taking the Exclusive Or of each character following the < symbol up to (but not including) the colon. The commas are also included in the checksum calculation.

AUTOMATIC SHEET FEEDER COMMANDS

ESC i

Function: Inserts a sheet from bin #1.

Format:

BASIC	CHR$(27) "i"
Hex	1B 69

Remarks: When the optional sheet feeder is installed, this command loads single-sheet paper from bin #1. (If the sheet feeder is not installed (sw 3-7: OFF), the command is ignored.)

ESC j

Function: Inserts a sheet from bin #2.

Format:

BASIC	CHR$(27) "j"
Hex	1B 70

Remarks: When the optional sheet feeder is installed, this command loads single-sheet paper from bin #2. (If the sheet feeder is not installed (sw 3-7: OFF), the command is ignored.)

ESC e

Function: Ejects paper.

Format:

BASIC	CHR$(27) "e"
Hex	1B 65

Remarks: When the optional sheet feeder is installed, this command ejects single-sheet paper from the printer, without loading a new sheet. (If the sheet feeder is not installed (SW 3-7: OFF), the command is ignored.)

TESTING COMMANDS

ESC CTRL-Z CTRL-N

Function: Selects remote test mode.

Format:

BASIC	CHR$(27) CHR$(26) CHR$(14)
Hex	1B 1A 0E

Remarks: This command initiates a self test program that checks the printer's mechanical and electronic functions. Once the self test has started, everything sent to the printer (including commands) is not ignored and finally the Premiere 35 is initialized.

ESC CTRL-Z CRTL-E

Function: Remote status request.

Format:

BASIC	CHR$(27) CHR$(26) CHR$(5)
Hex	1B 1A 05

Remarks: This command causes a status report byte to be sent through the interface which is used in error diagnostics. (This command is available for the serial interface RS-232C only.)

ESC: CHR$(n)

Function: Status reply.

Format:

BASIC	CHR$(27) ":" CHR$(n)
Hex	1B 3A nh

Remarks: This command causes a status reply byte to sent through the interface which is used in error diagnosis. (This is available for the serial interface RS-232C only.)

The true-state bit definitions for this byte "n" are the same as ESC SUB 1 (Status 1 request: Diablo). See page 19.

MISCELLANEOUS COMMANDS

CTRL-G (Bell)

Function: Sounds printer's alarm.

BASIC	CHR$(7)
Hex	07

Remarks: Sounds the Premiere 35's buzzer for 0.5 second.

ESC CTRL-M P

Function: Initializes printer.

Format:

BASIC	CHR$(27) CHR$(13) "P"
Hex	1B 0D 50

Remarks: Resets (initializes) the printer to the power on default values:

— the print head is returned to the leftmost position and the top-of-form (line 1) is set at the current paper position.

— the print buffer is not cleared and the printer is placed on line, unless an error condition is present (for example, the printer is out of paper). Printwheel download information is not cleared.

— all margins and tab settings are cleared.; page length is set according to rear switches 2-1, 2-2, and 2-3.

— the line spacing and character pitch are set to the indicators on the operation panel.

— forward printing is selected. Printing direction (unidirectional or bidirectional) is determined by rear switch 2-8.

— rear switch settings are recorded.

All rear switch settings are described in Appendix C.

ESC CTRL-Z I

Function: Initializes the printer.

Format:

BASIC	CHR$(27) CHR$(26)"I"
Hex	1B 1A 49

Remarks: This command is exactly the same as ESC CTRL-M P (described above) except that it clears printwheel download information.

ESC x -or- ESC X

Function: Forces execution of accumulated printer motions.

Format:

BASIC	CHR$(27) "x" -or- CHR$(27) "X"
Hex	1B 78 -or- 1B 58

Remarks: Normally, motions accumulate in the print buffer before execution and then are executed as a single movement. This process minimizes print head and paper movement, and thus increases printing speed. This command forces execution of all printer motions that have accumulated in the print buffer before more information is processed. You can use either an upper or lower-case "x" to perform this funciton.

ESC SPACE

Function: Prints special character 20h.

Format:

BASIC	CHR$(27) CHR$(32)
Hex	1B 20

Remarks: Prints the ESC SPACE character, which is the hexadecimal character 20h. The actual character printed depends on the printwheel installed.

ESC /

Function: Prints special character 7Fh.

Format:

BASIC	CHR$(27) "/"
Hex	1B 2F

Remarks: Prints the ESC / character, which is the hexadecimal character 7Fh. The actual character printed depends on the printwheel installed.

ESC S/ESC T

Function: Selects/cancels print suppression.

Format:	**ON**	**OFF**
BASIC	CHR$(27) "S"	CHR$(27) "T"
Hex	1B 53	1B 54

Remarks: When print suppression is selected, all printable characters are replaced with spaces until ESC T is received.

Chapter 4
NEC Command Descriptions

This chapter describes the commands used when the NEC 3550 option is selected. Rear switch 3-1 must be set to the ON position and switch 3-2 set to the OFF position at power up (see Appendix C for details).

PRINT STYLE COMMANDS

ESC S

Function: Selects pica pitch.

Format:

BASIC	CHR$(27) "S"
Hex	1B 53

Remarks: Pica pitch prints 10 characters per inch. Pica pitch is the power-on default pitch.

ESC I

Function: Selects elite pitch.

Format:

BASIC	CHR$(27) "I"
Hex	1B 49

Remarks: Elite pitch prints 12 characters per inch. You can cancel elite pitch by using another pitch command.

CTRL-O/CTRL-R or ESC CTRL-O/CTRL-R

Function: Selects/cancels condensed pitch.

Format:	**ON**	**OFF**
BASIC	CHR$(15) or CHR$(27) CHR$(15)	CHR$(18)
Hex	0F 1B 0F	12

Remarks: Condensed pitch prints 15 characters per inch. You can also use ESC SI to select condensed pitch. Canceling condensed pitch returns printing to the character pitch previously set.

CTRL-N/CTRL-T or ESC CTRL-N/CTRL-T

Function: Selects/cancels double-spaced printing.

Format:	**ON**	**OFF**
BASIC	CHR$(14) or CHR$(27) CHR$(14)	CHR$(20)
Hex	0E 1B 0E	14

Remarks: Double-spaced printing, which can also be selected with ESC SO, prints 5 characters per inch. Double-spaced printing is canceled by either a carriage return (CR) or DC4.

ESC] "@" through "O"

Function: Sets the character pitch (HMI) at a value from 0/120 to 15/120 inch.

Format:

BASIC	CHR$(27) "]" "@" through "O"
Hex	1B 50 40 ~ 4F

Remarks: Character pitch is also refered to as the Horizontal Motion Index, or HMI. The HMI is defined as 0/120 to 15/120 inch.

0/120 to 15/120 are represented by ASCII characters @ through O (see ASCII Table).
That is:

ESC]
- @ = 0/120 inch
- A = 1/120 inch
- B = 2/120 inch
- .
- .
- .
- H = 8/120 inch (15 cpi)
- J = 10/120 inch (12 cpi)
- L = 12/120 inch (10 cpi)
- O = 15/120 inch

ESC R/ESC T

Function: Selects/cancels proportional print.

Format:	**ON**	**OFF**
BASIC	CHR$(27) "R"	CHR$(27) "T"
Hex	1B 52	1B 54

Remarks: Proportional spacing varies the space between characters depending on their width. For example, an "M" is wider than an "I". (With fixed spacing, all characters and spaces are the same width.) A proportional print wheel must be installed to use this feature.

In some cases, commercial software controls the proportional spacing which overrides ESC R and ESC T.

Canceling proportional spacing returns printing to the previous character pitch selected.

ESC % CHR$(n) (n = 64 to 95)

Function: Sets character offset to n/120 inch.

Format:

BASIC	CHR$(27) "%" CHR$(n)	
Hex	1B 25nh	(nh = 40h to 5Fh)

Remarks: Character offset adds to or subtracts from the proportional spacing of all characters. The offset can range from 0 to 15/120 inch. The value of n is the size of the (in 1/120 inch increments). If n is positive, the offset is increased; if n is negative, the offset is decreased. The character offset is cleared by sending the command again and setting the offset to zero.

The value of n is determined by the seven bits as follows:

Bits 0-3 = Size of offset (1/120 inch)
Bit 4 = Sign of offset (1 = negative)
(0 = positive)

Bit 5 = Not used
Bit 6 = Always 1
Bit 7 = Not used

ESC -/ESC '

Function: Selects/cancels auto underscore.

Format:	**ON**	**OFF**
BASIC	CHR$(27) "-"	CHR$(27) "'"
Hex	1B 2D	1B 27

Remarks: This command causes all characters and spaces to be underscored from the point underscoring is selected to the point it is canceled. Spaces (which are inserted by centering,) at the beginning of a line and at the end of a line are not underlined. For example, if you center a line with ESC $ A, the spaces before the centered line are not underscored.

Underscoring is also canceled by ESC &.

ESC E/ESC F

Function: Selects/cancels double-strike (bold) print.

Format:

	ON	OFF
BASIC	CHR$(27) "E"	CHR$(27) "F"
Hex	1B 45	1B 46

Remarks: Characters are double-striked, producing bold print. Each character is printed once, then printed again with no horizontal or vertical offset. Double-strike and shadow print cannot be combined. Double-strike printing is also canceled by a carriage return (CR) or ESC &.

ESC G/ESC H

Function: Selects/cancels shadow print.

Format:

	ON	OFF
BASIC	CHR$(27) "G"	CHR$(27) "H"
Hex	1B 47	1B 48

Remarks: With shadow print, each character is printed once, then printed again offset horizontally 1/120 inch. Shadow and double-strike print cannot be combined. Shadow print is also canceled by a carriage return (CR) or ESC &.

ESC $ A

Function: Centers text between the left and right margin.

Format:

BASIC	CHR$(27) "$A"
Hex	1B 24 41

Remarks: Centers the text in a line between the current left and right margins.

ESC $ B

Function: Selects automatic justification.

Format:

BASIC	CHR$(27) "$B"
Hex	1B 24 42

Remarks: Automatic justification adjusts the space between characters within a line so that it fills the space between the current left and right margins (the first and last characters in the line are flush with each margin).

Justification is applied to space between words and between characters. The line is printed unjustified, if the length of a line of a text exceeds 150% of its original length or less than 90% of its original.

ESC &

Function: Cancels word processing features.

Format:

BASIC	CHR$(27) "&"
Hex	1B 26

Remarks: Word processing features that are canceled include: program mode, double-strike print, shadow print, underscoring, center text, and automatic justification. Proportional spacing, which is considered a word processing command, is not canceled.

ESC P/ESC L

Function: Selects/cancels program mode.

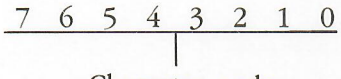
Format:	**ON**	**OFF**
BASIC	CHR$(27) "P"	CHR$(27) "L"
Hex	1B 50	1B 4C

Remarks: Program mode is a computer-directed proportional spacing mode. In this mode, all printable characters and spacing codes are accompanied by a second byte that determines the hammer impression level and the pitch (spacing). This is explained in the following.

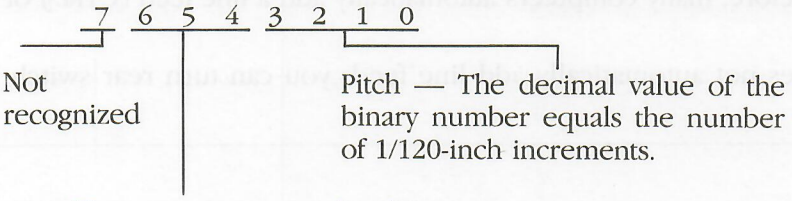
a. Printable character codes

These are two-byte commands. The first byte specifies the ASCII character code and the second byte specified the spacing pitch and the hammer impression level as follows.

First byte



Second byte


7 6 5 4 3 2 1 0
Not recognized
Pitch — The decimal value of the binary number equals the number of 1/120-inch increments.
Hammer impression level (1-8)

6 5 4	level
0 0 0	1 (weak)
0 0 1	2
0 1 0	3
0 1 1	4
1 0 0	5
1 0 1	6
1 1 0	7
1 1 1	8 (strong)

The second byte is ignored if it is a NUL code or a DEL code. The next data is recognized as the second byte.

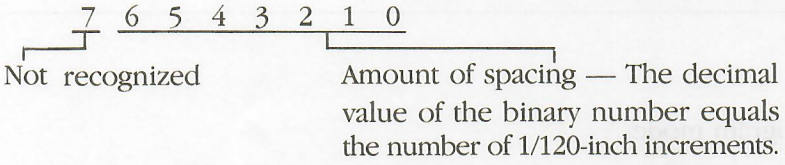
b. Spacing (SP) code

This is a two-byte command. The first byte is the SP code and the second byte specifies the amount of spacing between characters.

First byte

SP code

Second byte


7 6 5 4 3 2 1 0
Not recognized
Amount of spacing — The decimal value of the binary number equals the number of 1/120-inch increments.

LINE SPACING COMMANDS

CTRL-M (Carriage Return)
(also RETURN or ENTER)

Function: Return the print head to the left margin after printing.

Format:

BASIC	CHR$(13)
Hex	0D

Remarks: A carriage return moves the print head to the left margin, but does not advance the paper to the next line. Therefore, many computers automatically add a line feed (CTRL-J or ASCII 10) to each carriage return.

If your computer does not automatically add line feeds,you can turn rear switch 2-4 ON (see Appendix C)

ESC ^/ESC [

Function: Selects/cancels auto carriage return.

Format:	**ON**	**OFF**
BASIC	CHR$(27) "^"	CHR$(27) "["
Hex	1B 5E	1B 5B

Remarks: Adds a carriage return to the function of line feed, vertical tab, and form feed codes. This is software control of rear switch 2-5 ON.

CTRL-J (Line Feed)

Function: The line feed advances the paper to the next line after printing.

Format:

BASIC	CHR$(10)
Hex	0A

Remarks: The distance the paper is advanced is determined by the current line spacing (VMI) set with ESC A, ESC 0, ESC 1, or ESC 2. Many computers automatically add a line feed to each carriage return. If yours does not, you can turn rear switch 2-4 ON (see Appendix C).

ESC 7

Function: Negative (reverse) line feed.

Format:

BASIC	CHR$(27) "7"
Hex	1B 37

Remarks: A reverse line feed moves the paper down one line of the current line spacing, thus moving the printing position back toward the top of the page. Line spacing (VMI) is set with ESC A, ESC 0, ESC 1, or ESC 2.

ESC :

Function: Half line feed.

Format:

BASIC	CHR$(27) ":"
Hex	1B 3A

Remarks: A half line feed moves the paper one half line of the current line spacing. Line spacing (VMI) is set with ESC A, ESC 0, ESC 1, or ESC 2. You can use ESC : in combination with ESC ; to print superscripts and subscripts.

ESC ;

Function: Negative (reverse) half line feed.

Format:

BASIC	CHR$(27) ";"
Hex	1B 3B

Remarks: A reverse half line feed moves the paper down one half line of the current line spacing, thus moving the printing position back toward the top of the page. Line spacing (VMI) is set with ESC A, ESC 0, ESC 1, ESC 2. You can use ESC ; in combination with ESC : to print superscripts and subscripts.

ESC A CHR$(n) (n = 0 to 57) ESC 2

Function: Defines line spacing (VMI) of n/48 inch.

Format:

BASIC	CHR$(27) "A" CHR$(n)	CHR$(27) "2"	
Hex	1B 41 nh	1B 32	(nh = 00h to 39h)

Remarks: This command sets the line spacing for subsequent line feeds. The line spacing defined in ESC A must be activated by using ESC 2. Line spacing is also referred to as the Vertical Motion Index, or VMI. The VMI is determined in n/48 inch increments, where the value of n can range from 0 to 57.

ESC 2

Function: Activates the line spacing (VMI) defined by ESC A, or defaults to 6 lines per inch.

Format:

BASIC	CHR$(27) "2"
Hex	1B 32

Remarks: This command activates the line spacing defined in ESC A. If ESC A does not precede ESC 2, line spacing is set to 6 lines per inch (the power on default). Line spacing is also referred to as the Vertical Motion Index, or VMI.

ESC 0

Function: Sets the line spacing to 8 lines per inch.

Format:

BASIC	CHR$(27) "0"
Hex	1B 30

Remarks: Line spacing is set to 8 lines per inch (6/48 inch), which can be helpful with printwheels that use line and block graphics. Line spacing is also referred to as the Vertical Motion Index, or VMI.

This command uses the number zero, not the letter O.

ESC 1

Function: Sets the line spacing to 5/48 inch (about 10 lines per inch).

Format:

BASIC	CHR$(27) "1"
Hex	1B 31

Remarks: Line spacing is set to 5/48 inch, which can be helpful with printwheels that use line and block graphics because the lines overlap. Line spacing is also referred to as the Vertical Motion Index, or VMI.

PAGE DESIGN COMMANDS

CTRL-L (Form Feed)

Function: Advances the paper to the top of the next page.

Format:

BASIC	CHR$(12)
Hex	0C

Remarks: The top of form, or TOF, is set by the position of the paper when:

— the printer is turned on.
— when the control panel TOP OF FORM button is pressed.
— when the printer is initialized (ESC = or ESC # A).
— when the page length is set with ESC C.
— when the paper is inserted by operating the paper bail.

ESC C CHR$(n) (n = 1 to 126)

Function: Sets the page length to n lines.

Format:

BASIC	CHR$(27) "C" CHR$(n)	
Hex	1B 43 nh	(nh = 01h to 7Eh)

Remarks: This command sets the length of the page to n lines, where n can range from 1 to 126. This command sets the top of form at the current paper position.

The page length, being stored as an absolute distance, does not change the line spacing with ESC A, ESC 0, ESC 1, or ESC 2.

ESC M

Function: Sets the left margin at the current print head position.

Format:

BASIC	CHR$(27) "M"
Hex	1B 4D

Remarks: Before this command is used, the print head must be moved left or right, to the column position where you want the margin to be set.

ESC J

Function: Sets the right margin at the current print head position.

Format:

BASIC	CHR$(27) "J"
Hex	1B 4A

Remarks: Before this command is used, the print head must be moved left or right, to the column position where you want the margin to be set.

ESC U CHR$(n) (n = 1 to 126)

Function: Sets the left margin at column n-1.

Format:

BASIC	CHR$(27) "U" CHR$(n)	
Hex	1B 55 nh	(nh = 01h to 7Eh)

Remarks: Sets the left margin at column n-1 of the current character pitch (HMI). The leftmost print position is column 0. The value of n can range from 1 to 126. If n is greater than 126, the command is ignored.

ESC W CHR$(n) (n = 1 to 126)

Function: Sets the right margin at column n-1.

Format:

BASIC	CHR$(27) "W" CHR$(n)	
Hex	1B 57 nh	(nh = 01h to 7Eh)

Remarks: Sets the right margin at column n-1 of the current character pitch (HMI). The leftmost print position is column 0. The value of n can range from 1 to 126. If n is greater than 126, the command is ignored.

ESC O

Function: Clears the left margin.

Format:

BASIC	CHR$(27) "O"
Hex	1B 4F

Remarks: Clears the left margin set by ESC M or ESC U. This command uses the letter O, not the number zero.

ESC K

Function: Clears the right margin.

Format:

BASIC	CHR$(27) "K"
Hex	1B 4B

Remarks: Clears the right margin set by ESC J or ESC W.

HORIZONTAL MOTION COMMANDS

ESC Q

Function: Moves the print head left in 1/120 inch increments.

Format:

BASIC	CHR$(27) "Q"
Hex	1B 51

Remarks: This command is used when very fine backspacing is required. Each time the command is received, the print head moves to the left 1/120 inch.

ESC)

Function: Selects unidirectional printing.

Format:

BASIC	CHR$(27) ")"
Hex	1B 29

Remarks: This command causes each line to be printed from left to right, allowing very fine vertical alignment between lines (for columns, grids, and so on). Unidirectional printing can be set as the power on default by turning rear switch 2-8 ON. Unidirectional printing is canceled by ESC (which selects bidirectional printing.

ESC (

Function: Selects bidirectional printing.

Format:

BASIC	CHR$(27) "("
Hex	1B 28

Remarks: Bidirectional printing maximizes printing speed. Bidirectional printing can be set as the power on default by turning rear switch 2-8 OFF. Bidirectional printing is canceled by ESC) which selects unidirectional printing.

TAB COMMANDS

CTRL-I (Horizontal Tab)

Function: Moves the print head to the next horizontal tab position.

Format:

BASIC	CHR$(9)
Hex	09

Remarks: A horizontal tab moves the print head to the right to the next horizontal tab position set by ESC D. Horizontal tab settings are column-dependent, that is the tab position changes on the paper according to the change in character pitch. At power on, there are no tab settings; a horizontal tab doesn't move the print head then the audible alarm sounds.

ESC D CHR$(n1) CHR$(n2) CHR$(n3)...CHR$(0)

Function: Sets horizontal tab positions at columns n1, n2, n3, and so on.

Format:

BASIC	CHR$(27) "D" CHR$(n1) CHR$(n2) CHR$(n3)...CHR$(0)
Hex	1B 44 n1h n2h n3h...00

Remarks: Up to 100 horizontal tab positions can be set (more than 100 are ignored). The values of n1, n2, n3, and so on, must be entered in ascending order and ended with a NUL or the command will be ignored. The leftmost print position is colomn 0. Horizontal tab settings are column-dependent, that is the tab position changes on the paper according to the change in character pitch. When you use this command to set new tab positions, it clears any previous settings. ESC D NUL clears all horizontal tab positions.

CTRL-K (Vertical Tab)

Function: Moves the print head to the next vertical tab position.

Format:

BASIC	CHR$(11)
Hex	0B

Remarks: A vertical tab advances the paper to the next vertical tab position set by ESC B. Tab settings are not affected by changes in line spacing (VMI). At power on, there are no tab settings; a vertical tab simply causes a line feed.

ESC B CHR$(n1) CHR$(n2) CHR$(n3)...CHR$(0)

Function: Sets vertical tab positions at lines n1, n2, n3, and so on.

Format:

BASIC	CHR$(27) "B" CHR$(n1) CHR$(n2) CHR$(n3)...CHR$(0)
Hex	1B 42 n1h n2h n3h...00

Remarks: Up to 128 vertical tab positions can be set (more than 128 are ignored). The values of n1, n2, n3, and so on, must be entered in ascending order and ended with a NUL or the command will be ignored. The top of form position is line 0. This command clears any previous settings.

Vertical tab positions are not affected by changing the line spacing (VMI). ESC B NUL clears all vertical tab positions.

AUTOMATIC SHEET FEEDER COMMANDS

ESC \ A

Function: Inserts a sheet from bin #1.

Format:

BASIC	CHR$(27) " \A"
Hex	1B 5C 41

Remarks: When the optional sheet feeder is installed, this command loads single-sheet paper from bin #1. (If the sheet feeder is not installed, the command is ignored.)

ESC \ B

Function: Inserts a sheet bin #2.

Format:

BASIC	CHR$(27) " \B"
Hex	1B 5C 42

Remarks: When the optional sheet feeder is installed, this command loads single-sheet paper from bin #2. (If the sheet feeder is not installed, the command is ignored.)

ESC \ E

Function: Ejects paper and loads a new sheet.

Format:

BASIC	CHR$(27) " \E"
Hex	1B 5C 45

Remarks: When the optional sheet feeder is installed, this command ejects paper and loads a new sheet. (If the sheet feeder is not installed, the command is ignored.)

ESC \ F

Function: Eject paper

Format:

BASIC	CHR$(27) " \F"
Hex	1B 5C 46

Remarks: When the optional sheet feeder is installed, this command ejects paper. (If the sheet feeder is not installed, the command is ignored.)

MISCELLANEOUS COMMANDS

ESC =

Function: Initializes printer.

Format:

BASIC	CHR$(27) "="
Hex	1B 3D

Remarks: Resets (initializes) the printer to the power on default values:

— the print head is returned to the leftmost position and top of form is set at the current paper position.

— the printer is placed on line, unless an error condition is present (for example the printer is out of paper). The printwheel download information cleared.

— all margins and tab settings are cleared. Line spacing and character pitch are set to the indicators on the operation panel; page length is set according to rear switches 2-1, 2-2, and 2-3.

— forward printing is selected. Printing direction (unidirectional or bidirectional) is determined by rear switch 2-8.

— rear switch settings are recorded.

All rear switch settings are described in Appendix C.

ESC #A

Function: Initializes printer.

Format:

BASIC	CHR$(27) "#A"
Hex	1B 23 41

Remarks: This command is the same as ESC = (described above), except that printwheel download information is not cleared.

ESC # P

Function: Selects print suppression (disables the print hammer).

Format:

BASIC	CHR$(27) "#P"
Hex	1B 23 50

Remarks: When print suppression is selected, all printable characters are replaced with spaces until a carriage return (CR) is received.

ESC >/ESC <

Function: Enables/disables SI and ESC SI function.

Format:	**ON**	**OFF**
BASIC	CHR$(27) ">"	CHR$(27) "<"
Hex	1B 3E	1B 3C

Remarks: When printing more than 80 columns, the IBM-PC automatically sends the SI code, changing the character pitch to 15 characters per inch. By disabling the SI (or ESC SI) function, you can print a full 132 columns (in 10 pitch).

ESC 9/ESC 8

Function: Enables/disables the paper-out detector.

Format:	**ON**	**OFF**
BASIC	CHR$(27) "9"	CHR$(27) "8"
Hex	1B 39	1B 38

Remarks: The paper-out detector turns the printer off line and the printer stops printing about two inches from the bottom of the last page. By disabling the paper out detector, you can continue to print to the bottom of the paper (and beyond). You can also disable the paper-out detector by turning rear switch 3-5 OFF.

ESC ./ESC /

Function: Selects/cancels graphics mode.

Format:	**ON**	**OFF**
BASIC	CHR$(27) "."	CHR$(27) "/"
Hex	1B 2E	1B 2F

Remarks: In the graphics mode, the print head does not move after characters are printed. Spaces advance the print head horizontally in 1/60 inch increments; back spaces move the print head to the left. Line feeds and negative line feeds move the paper vertically in 1/48 inch increments. The graphics mode is also canceled by a carriage return.

CTRL-G (Bell)

Function: Sounds printer's alarm.

BASIC	CHR$(7)
Hex	07

Remarks: Sounds the Premiere 35's buzzer for 0.5 second.

Chapter 5
Premiere 35 Unique Command Descriptions

These commands are unique to the Citizen Premiere 35. They work in any of the seven command sets.

ESC t

Function: Prints the current time.

Format:

BASIC	CHR$(27) "t"
Hex	1B 74

Remarks: This command prints the time at the current print head and paper position, printed in this format: "09:52 AM." (the quotation marks are not included, but the period is).

You can also print the current time using the control panel buttons. Refer to the *Premiere 35 User's Manual* for details.

ESC d

Function: Prints the current date.

Format:

BASIC	CHR$(27) "d"
Hex	1B 64

Remarks: This command prints the date at the current print head and paper position, printed in this format: "14/SEP/1985" (the quotation marks are not included).

You can also print the current date using the control panel buttons. Refer to the *Premiere 35 User's Manual* for details.

ESC p

Function: Prints the current time and date.

Format:

BASIC	CHR$(27) "p"
Hex	1B 70

Remarks: This command prints the time and date at the current print head and paper position, printed in this format: "03:45 PM. 16/OCT/1985" (the quotation marks are not included, but the period is).

You can also print the current time and date using the control panel buttons. Refer to the *Premiere 35 User's Manual* for details.

AUTOMATIC SHEET FEEDER INITIALIZE COMMAND

ESC g

Function: Initializes auto sheet feeder for paper.

Format:

BASIC	CHR$(27); "g"
Hex	1B 67

Remarks: This command initializes the Auto Sheet Feeder to select Bin 1 for normal paper. (If the sheet feeder is installed.)

ESC h

Function: Initializes auto sheet feeder for an envelope.

Format:

BASIC	CHR$(27); "h"
Hex	1B 68

Remarks: This command initializes the Auto Sheet Feeder to select Bin 1 for a envelope.

COPY COMMAND

ESC STX (n) [TEXT] ESC ETX

Function: Prints the same [TEXT] for "n" times.

Format:

BASIC	CHR$(27) CHR$(2) CHR$(n) "TEXT" CHR$(27) CHR$(3)
Hex	1B 02 nh [TEXT] 1B 03

Remarks: This command prints the text "n" times; where the value of "n" can range from 1 to 126. If "n" equals zero or more than 127, the text will be printed one time.

If the total bytes (n + "text" + ESC + ETX) equal more than 8000 bytes (parallel interface) or 7700 bytes (serial interface); this command is ignored and the message "BF FULL" will be displayed.

HEX DUMP COMMAND

ESC SUB FS

Function: Prints the hex codes as it is received to the printer from the CPU.

Format:

BASIC	CHR$(27) CHR$(26) CHR$(28)
Hex	1B 1A 1C

Remarks: This command prints the hex codes. Please refer to following sample.

If the hex code is from 21h to 7Eh, the characters are printed, otherwise it will be spaced.

When this mode is terminated, the power is turned off and on.

```
ØØØ1:  21 22 23 24 25 26 27 28 29 2A 2B 2C 2D 2E 2F 3Ø   ! " # $ % & ' ( ) * + , - . / Ø
ØØØ2:  31 32 33 34 35 36 37 38 39 3A 3B 3C 3D 3E 3F 4Ø   1 2 3 4 5 6 7 8 9 : ; < = > ? @
ØØØ3:  41 42 43 44 45 46 47 48 49 4A 4B 4C 4D 4E 4F 5Ø   A B C D E F G H I J K L M N O P
ØØØ4:  51 52 53 54 55 56 57 58 59 5A 5B 5C 5D 5E 5F 6Ø   Q R S T U V W X Y Z [ \ ] ^ _ `
ØØØ5:  61 62 63 64 65 66 67 68 69 6A 6B 6C 6D 6E 6F 7Ø   a b c d e f g h i j k l m n o p
ØØØ6:  71 72 73 74 75 76 77 78 79 7A 7B 7C 7D 7E ØD ØA   q r s t u v w x y z { | } ~
```

Appendix A
Commands in Numerical Order

DIABLO COMMANDS

BEL	Sounds printer's alarm
BS	Backspace
HT	Horizontal tab
LF	Line feed
VT	Vertical tab
FF	Form feed
CR	Carriage return
ESC BS	Fine back space (1/120inch)
ESC HT n	Absolute horizontal tab to column n
ESC LF	Negative (reverse) line feed
ESC VT n	Absolute vertical tab to line n
ESC FF n	Set page length to n lines
ESC CR P	Initialize printer
ESC SO M	Selects program mode (canceled by SI or ESC X)
ESC DC1 n	Selects offset selection (canceled by CR)
ESC EM 1	Inserts a paper from bin # 1
ESC EM 2	Inserts a paper from bin # 2
ESC EM R	Ejects a paper
ESC SUB 1	Requests status 1
ESC SUB 2	Requests status 2
ESC SUB I	Initializes printer
ESC RS n	Sets line spacing (VMI) to (n—1)/48 inch
ESC US n	Sets character pitch (HMl) to (n—1)/120 inch
ESC !	Cancels auto carriage return
ESC "	Selects auto line feed
ESC #	Cancels auto line feed
ESC $	Selects right margin control
ESC %	Increases carriage settling time to 20 msec (canceled by ESC N)
ESC &	Cancels bold or shadow print
ESC *	Cancel right margin control
ESC , hv	Sets plot precision (HyPlot)
ESC –	Sets vertical tab at current paper position
ESC . (character)	Changes plot character
ESC /	Selects bidirectional printing
ESC 0	Sets right margin
ESC 1	Sets horizontal tab at the current print head position
ESC 2	Clears all horizontal and vertical tabs
ESC 3	Selects graphics mode (canceled by CR)

ESC 4	Cancels graphics mode
ESC 5	Cancels backward printing
ESC 6	Selects backward printing (canceled by CR)
ESC 7	Selects print suppression (canceled by CR)
ESC 8	Clears horizontal tab at current printhead position
ESC 9	Sets left margin
ESC <	Selects reverse printing
ESC ?	Selects auto carriage return (canceled by ESC!)
ESC =	Centers a line of text
ESC >	Cancels reverse printing
ESC C	Clears top and bottom margins
ESC D	Negative (reverse) half line feed
ESC E	Selects auto underscore (canceled by CR)
ESC G	Sets HyPlot (Absolute move)
ESC G BEL	Sets HyPlot (Absolute plot)
ESC L	Sets bottom margin
ESC M	Selects automatic justification (canceled by ESC X)
ESC N	Cancels ESC %
ESC O	Selects bold print (canceled by CR)
ESC P	Selects proportional print (canceled by ESC S)
ESC Q	Cancels proportional print
ESC R	Cancels auto underscore
ESC S	Sets default pitch (HMI) indicated on CPI
ESC T	Sets top margin
ESC U	Half line feed
FSC V	Sets HyPlot (relative move)
ESC V BEL	Sets HyPlot (relative plot)
ESC W	Selects shadow print (canceled by CR)
ESC X	Cancels all word processing features (except proportional spacing)
ESC Y	Prints special character 20h
ESC Z	Prints special character 7Fh
ESC \	Selects unidirectional printing

QUME COMMANDS

BEL	Sounds printer's alarm
BS	Backspace
HT	Horizontal tab
LF	Line feed
FF	Form feed
CR	Carriage return
US n	Selects program mode carriage motion
ESC BS	Backspace 1/120 inch
ESC HT n	Absolute horizontal tab to column n
ESC LF	Negative (reverse) line feed
ESC VT n	Absolute vertical tab to line n
ESC CR P	Initializes printer
ESC SO	Selects program mode
ESC SI	Cancels all program modes
ESC SUB I	Initializes printer
ESC SUB ENQ	Remote status request in test mode
ESC SUB SO	Selects remote test mode
ESC RS n	Sets the line spacing (VMI) to (n—1)/48 inch
ESC US n	Sets character pitch (HMI) to (n—1)/120 inch
ESC SP	Prints special character 20h

ESC #	Selects secondary program mode
ESC $	Selects proportional print
ESC %	Cancels proportional print
ESC (d1 d2 , d1 d2 , . . . d1n d2n	Sets multiple horizontal tab positions specified by pairs of d1 and d2
ESC) d1 d2 , d1 d2 , . . . d1n d2n	Clears multiple horizontal tab positions specified by pairs of d1 and d2
ESC +	Sets top margin
ESC ,	Selects automatic line feed
ESC —	Sets bottom margin
ESC .	Cancels automatic line feed
ESC /	Prints special character 7Fh
ESC 0	Sets right margin
ESC 1	Sets horizontal tab at current print head position
ESC 2	Clears all horizontal tabs
ESC 3	Selects graphics mode (1/60 inch HMI)
ESC 4	Cancels all graphics modes
ESC 5	Cancels backward printing
ESC 6	Selects backward printing
ESC 8	Clears horizontal tab at current print head position
ESC 9	Sets left margin
ESC : n	Status reply (test mode)
ESC <	Selects bidirectional printing
ESC >	Selects unidirectionl printing
ESC C n1 n2	Absolute horizontal tab to column specified by n1 and n2
ESC D	Negative (reverse) half line feed
ESC E n1 n2	Sets character pitch (HMI) in 1/120 inch increments specified by n1 and n2
ESC F n1 n2	Sets page length specified by n1 and n2
ESC G	Selects graphics mode (1/120 inch HMI)
ESC H n1 n2 n3	Selects relative print head motion specified by n1, n2, and n3
ESC I	Selects auto underscore
ESC J	Cancels auto underscore
ESC K n	Selects bold print (n=1 to 4)
ESC L n1 n2	Sets line spacing (VMI) in 1/48 inch increments specified by n1 and n2
ESC M	Cancels bold print
ESC N	Disables print head movement for one character (backspace)
ESC O	Selects right margin control
ESC P n1 n2	Absolute vertical tab to line specified by n1 and n2
ESC Q	Selects shadow print
ESC R	Cancels shadow print
ESC S	Selects print suppression
ESC T	Cancels print suppression
ESC U	Half line feed
ESC V n1 n2 n3	Selects relative paper movement specified by n1, n2, and n3
ESC W	Selects automatic carriage return
ESC X	Forces execution of accumulated printer motions
ESC Y	Cancels right margin contol
ESC Z	Cancels automatic carriage return
ESC a < ascii pos rib ham wid >	Defines download print wheel table
ESC a d	Cancels download print wheel table
ESC a e	Selects download print wheel table
ESC e	Ejects paper (optional sheet feeder installed)
ESC i	Selects bin # 1 (optional sheet feeder installed)
ESC j	Selects bin # 2 (optional sheet feeder installed)
ESC x	Forces execution of accumulated printer motions

NEC COMMANDS

BEL	Sounds printer's alarm
HT	Horizontal tab
LF	Line feed
VT	Vertical tab
FF	Form feed
CR	Carriage return
SO	Selects double-spaced (5 characters per inch) printing
SI	Selects condensed pitch (15 characters per inch)
DC 2	Cancels condensed pitch (15 characters per inch)
DC 4	Cancels double-spaced (5 characters per inch) printing
ESC SI	Selects condensed pitch (15 characters per inch)
ESC SO	Selects double-spaced (5 characters per inch) printing
ESC # A	Initializes printer
ESC # P	Selects print suppression (disables print hammer)
ESC $ A	Centers text between left and right margin
ESC $ B	Selects automatic justification
ESC % n	Sets character offset to n/120 inch
ESC &	Cancels word processing features
ESC '	Cancels auto underscore
ESC)	Selects unidirectional printing
ESC (	Selects bidirectional printing
ESC -	Selects auto underscore
ESC .	Selects graphics mode
ESC /	Cancels graphics mode
ESC 0	Sets line spacing to 8 lines per inch
ESC 1	Sets line spacing to 5/48 inch (about 10 lines per inch)
ESC 2	Activates ESC A line spacing or defaults to 6 lines per inch
ESC 7	Negative (reverse) line feed
ESC 8	Disables paper-out detector
ESC 9	Enables paper-out detector
ESC :	Half line feed
ESC ;	Negative (reverse) half line feed
ESC <	Disables SI and ESC SI function
ESC =	Initializes printer
ESC >	Enables SI and ESC SI function
ESC A n ESC 2	Defines line spacing (VMI) of n/48 inch
ESC B n1 n2 n3 . . . NUL	Sets vertical tab positions at line n1 , n2 , n3 , and so on
ESC C n	Sets page length to n lines
ESC D n1 n2 n3 . . . NUL	Sets horizontal tab positions at column n1 , n2 , n3 , and so on
ESC E	Selects double-strike (bold) print
ESC F	Cancels double-strike (bold) print
ESC G	Selects shadow print
ESC H	Cancels shadow print
ESC I	Selects elite pitch (12 characters per inch)
ESC J	Sets right margin
ESC K	Clears right margin
ESC L	Cancels program mode
ESC M	Sets left margin
ESC O	Clears left margin
ESC P	Selects program mode
ESC Q	Backspace 1/120 inch
ESC R	Selects proportional print
ESC S	Selects pica pich (10 characters per inch)
ESC T	Cancels proportional print

ESC U n	Sets left margin at column n
ESC W n	Sets right margin at column n
ESC \ A	Selects bin # 1 (optional sheet feeder installed)
ESC \ B	Selects bin # 2 (optional sheet feeder installed)
ESC \ E	Ejects paper and loads new sheet (optional sheet feeder installed)
ESC \ F	Ejects paper (optional sheet feeder installed)
ESC] n	Sets character pitch (HMI) to n/120 inch
ESC ^	Selects auto carriage return
ESC [	Cancels auto carriage return

PREMIERE 35 UNIQUE COMMANDS

ESC d	Prints the current date
ESC p	Prints the current time and date
ESC t	Prints the current time
ESC STX (n) [text]ESC ETX	Copy command
ESC SUB FS	Starts hex dump mode
ESC g	Initializes Bin # 1 to paper (optional sheet feeder installed)
ESC h	Initializes Bin # 1 to envelope (optional sheet feeder installed)

Appendix B
ASC II Code Conversion

ASCII Codes Decimal	Hexadecimal	Control Keys	Abbreviation
0	00	CTRL-@	NUL
1	01	CTRL-A	SOH
2	02	CTRL-B	STX
3	03	CTRL-C	ETX
4	04	CTRL-D	EOT
5	05	CTRL-E	ENQ
6	06	CTRL-F	ACK
7	07	CTRL-G	BEL
8	08	CTRL-H	BS
9	09	CTRL-I	HT
10	0A	CTRL-J	LF
11	0B	CTRL-K	VT
12	0C	CTRL-L	FF
13	0D	CTRL-M	CR
14	0E	CTRL-N	SO
15	0F	CTRL-O	SI
16	10	CTRL-P	DLE
17	11	CTRL-Q	DC1
18	12	CTRL-R	DC2
19	13	CTRL-S	DC3
20	14	CTRL-T	DC4
21	15	CTRL-U	NAK
22	16	CTRL-V	SYN
23	17	CTRL-W	ETB
24	18	CTRL-X	CAN
25	19	CTRL-Y	EM
26	1A	CTRL-Z	SUB
27	1B	CTRL-[	ESC
28	1C		FS
29	1D		GS
30	1E		RS
31	1F		US
32	20		SPACE

ASCII Codes		Character
Decimal	Hexadecimal	(Courier 10)
33	21	!
34	22	"
35	23	#
36	24	$
37	25	%
38	26	&
39	27	'
40	28	(
41	29	)
42	2A	*
43	2B	+
44	2C	,
45	2D	-
46	2E	.
47	2F	/
48	30	Ø
49	31	1
50	32	2
51	33	3
52	34	4
53	35	5
54	36	6
55	37	7
56	38	8
57	39	9
58	3A	:
59	3B	;
60	3C	<
61	3D	=
62	3E	>
63	3F	?
64	40	@
65	41	A
66	42	B
67	43	C
68	44	D
69	45	E
70	46	F
71	47	G
72	48	H
73	49	I
74	4A	J
75	4B	K
76	4C	L
77	4D	M
78	4E	N
79	4F	O
80	50	P
81	51	Q
82	52	R
83	53	S

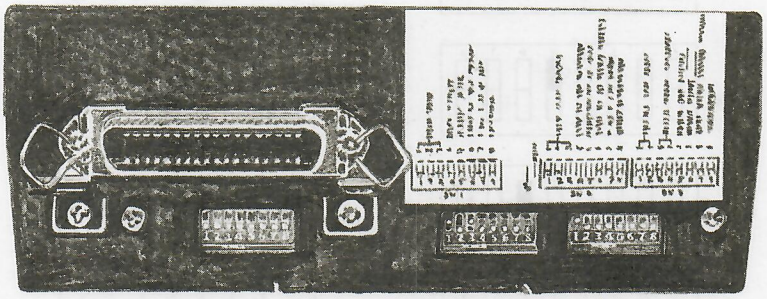
ASCII Codes		Character
Decimal	Hexadecimal	(Courier 10)
84	54	T
85	55	U
86	56	V
87	57	W
88	58	X
89	59	Y
90	5A	Z
91	5B	[
92	5C	\
93	5D	]
94	5E	^
95	5F	
96	60	`
97	61	a
98	62	b
99	63	c
100	64	d
101	65	e
102	66	f
103	67	g
104	68	h
105	69	i
106	6A	j
107	6B	k
108	6C	l
109	6D	m
110	6E	n
111	6F	o
112	70	p
113	71	q
114	72	r
115	73	s
116	74	t
117	75	u
118	76	v
119	77	w
120	78	x
121	79	y
122	7A	z
123	7B	{
124	7C	|
125	7D	}
126	7E	~
127	7F	DEL

Appendix C
The Rear Switches

The Premiere 35 contains three sets of switches that allow you to control the way it acts. These rear switches determine the default condition for several of the Premiere 35's features – that is, whether the feature is on or off when the Premiere 35 is turned on.

Most of the features that are controlled by the rear switches can be controlled equally well using software commands. Most can also be changed with BASIC commands regardless of how the switches are set.

The rear switches are located at the rear of the printer, right next to the interface connection (as shown in the illustration).



SWITCH SETTINGS

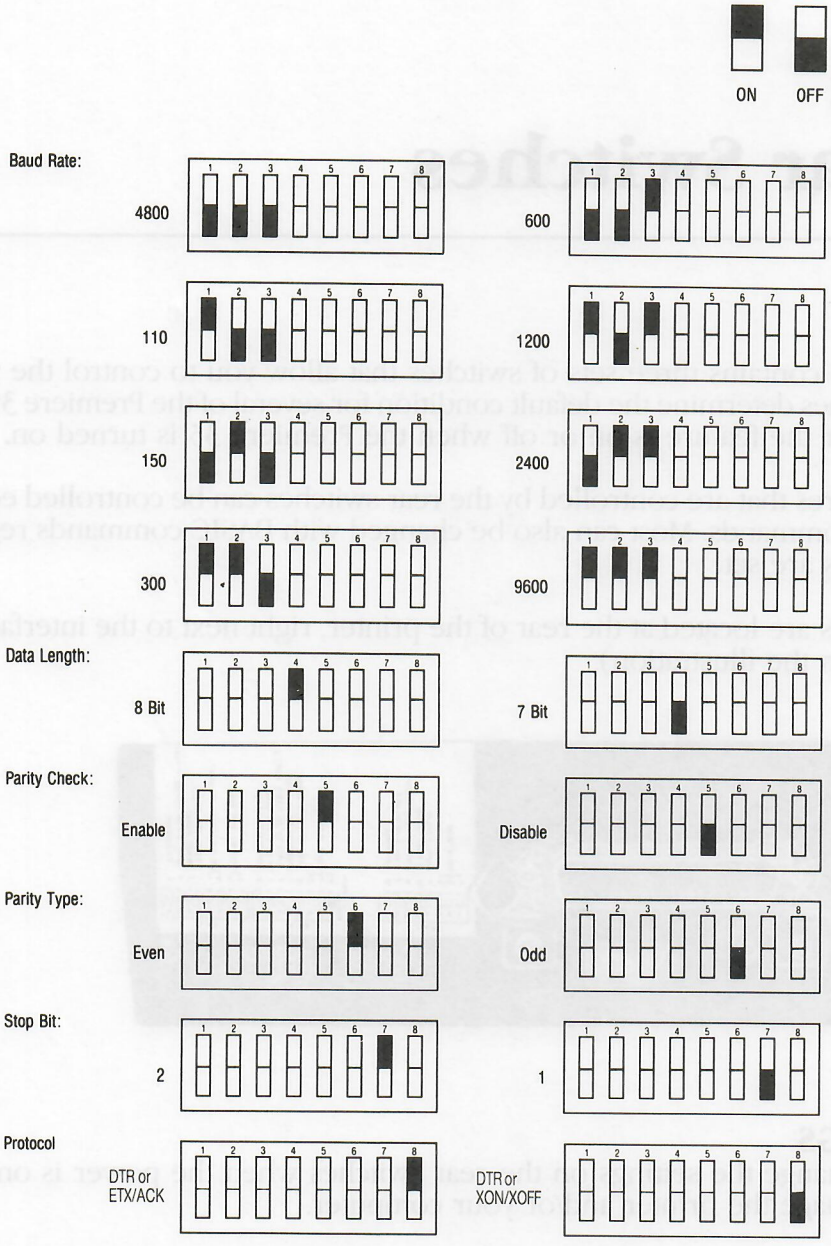
WARNING: Never change the settings on the rear switches when the power is on. Doing so may damage the printer and/or your computer.

The rear switches are identified just below each set as SW1 (switch 1), SW2 (switch 2), and SW3 (switch 3). Each set consists of eight individual switches. Rear switch 1, labeled 1-1 through 1-8, is used only if you install the optional serial interface. Rear switches 2 and 3, labeled 2-1 through 2-8 and 3-1 through 3-8, are used to control several different printer functions (regardless of which interface you use).

Each individual switch has two positions: OFF (which is the down position) and ON (which is the up position). For example, to choose the NEC 3550 command set, set switch 3-1 OFF and 3-2 ON. You can use a ballpoint pen, similar object, to move the switch (don't use a pencil though; the point may break).

The settings and functions are described below. Just above switches 2 and 3 on the printer, you'll also find a quick reference for all switch setting.

Rear Switch 1



Refer to your computer's operations manual for the settings you need. At first, you may try 4800. baud, seven data bits, even parity, one stop bit, and XON/XOFF protocol. Then find the appropriate command for your computer to match these settings. (For MS-DOS, use the MODE command; you may also have to save these settings in your application program).

Switches 1-1, 1-2, and 1-3. These switches are combined to select the baud rate according to the requirements of your computer (and software).

Switch 1-4 sets the data length to either seven (switch 1-4 OFF) or eight (switch 1-4 ON) bits.

Switch 1-5 enables or disables the parity check set by switch 1-6.

Switch 1-6 sets ODD parity check (switch 1-6 OFF) or EVEN parity check (switch 1-6 ON).

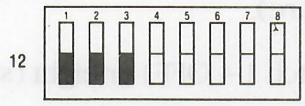
Switch 1-7 uses one stop bit (switch 1-7 OFF) or stop bits (switch 1-7 ON).

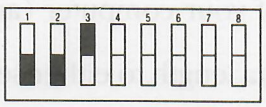
Switch 1-8 selects the communications protocol used for the serial interface to XON/XOFF (switch 1-8 OFF) or ETX/ACK (switch 1-8 ON) DTR protocol is selected on each position (switch 1-8 ON or OFF)

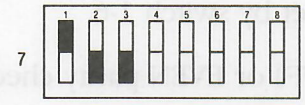
Note: If you select the baud rate to 9800 baud, please set the data length to eight bits, 2 stop bits and the parity check to enable.

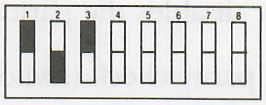
Rear Switch 2

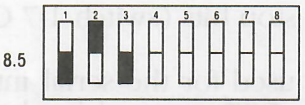
Form Length: (inches)

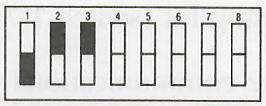


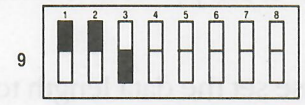


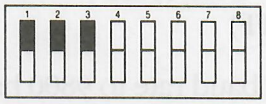




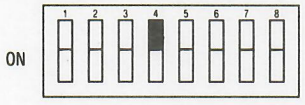


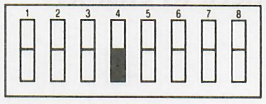




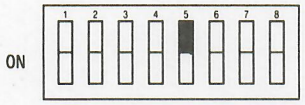


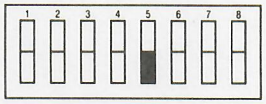
Automatic Line Feed:



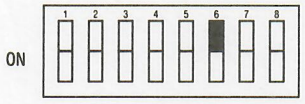


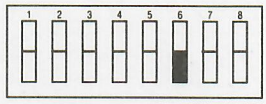
Automatic Carriage Return:



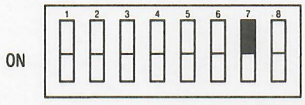


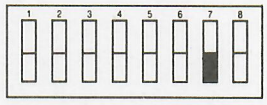
Right Margin Control:



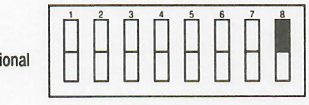


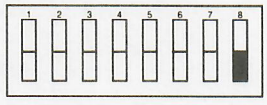
Set Eighth Bit:





Printing Direction:





Switches 2-1, 2-2, and 2-3. These three switches are combined to select between eight possible default page lengths to accommodate different types of paper, labels, and forms.

Switch 2-4 selects (ON) or cancels (OFF) automatic line feed. With this option selected, a line feed (LF) is inserted whenever the printer receives a carriage return (CR). If your computer does not send a line feed with each carriage return, set this switch ON. If you are unsure, try printing some text. If it comes out double-spaced when you expect single-spaced, turn this switch OFF. If the paper doesn't advance at all, turn this switch ON.

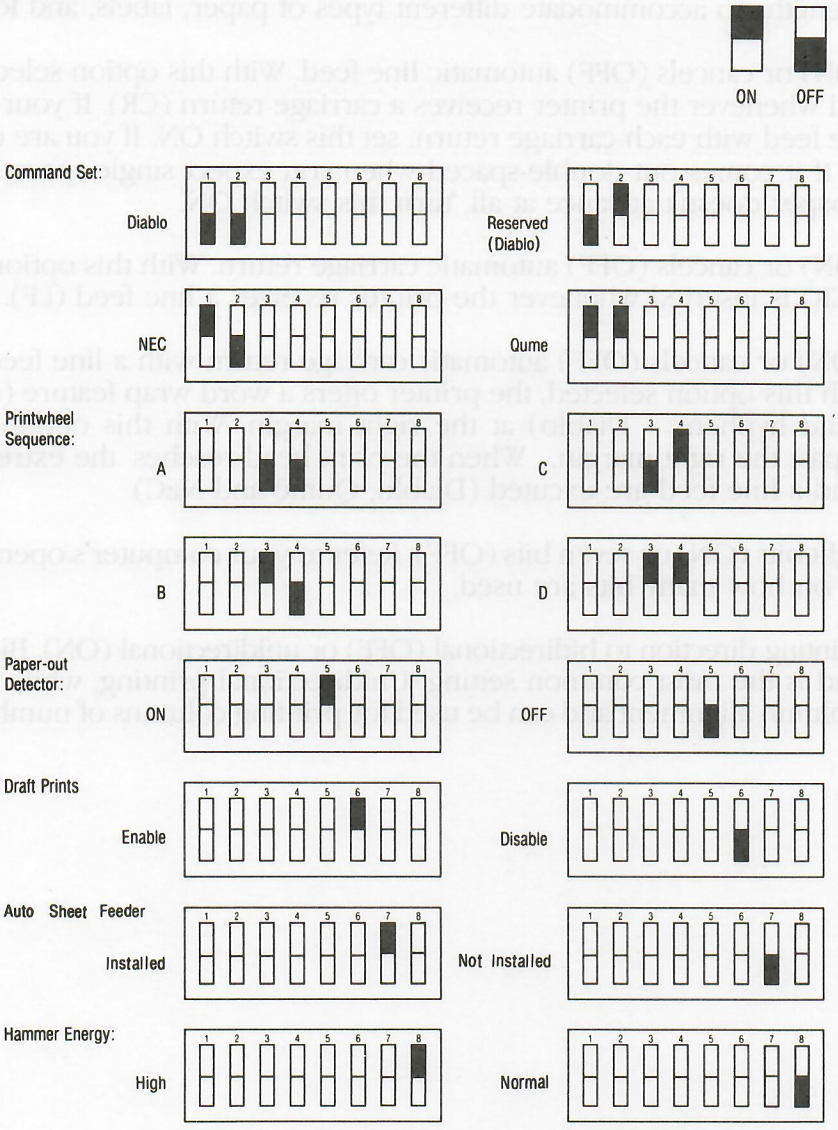
Switch 2-5 selects (ON) or cancels (OFF) automatic carriage return. With this option selected, a carriage return (CR) is inserted whenever the printer receives a line feed (LF).

Switch 2-6 selects (ON) or cancels (OFF) automatic carriage return with a line feed for right margin control. With this option selected, the printer offers a word wrap feature (on spaces-Qume, or spaces and hyphens – Diablo) at the right margin. With this option canceled, printing continues past the right margin. When the print head reaches the extreme right, a carriage return and a line feed are excuted (Diablo, Qume and NEC).

Switch 2-7 selects eight bits (ON) or seven bits (OFF). Refer to your computer's operating manual for information on how many bits are used.

Switch 2-8 sets the printing direction to bidirectional (OFF) or unidirectional (ON). Bidirectional printing is faster and is the most common setting. Unidirectional printing, while somewhat slower, improves column alignment and can be used for printing columns of numbers, grids, and so on.

Rear Switch 3



Switches 3-1, 3-2. These two switches are combined to select between the Diablo 630, NEC 3550, and Qume Sprint 11 command sets, allowing you to use software that is compatible with these printers.

Switches 3-3 and 3-4. The Premiere 35 has printwheel sequence information stored in the printer's permanent memory for several standard types of printwheels. These two switches are combined to select the printwheel sequence you need as follows (the wheel sequence label should appear on your printwheel):

Sequence A = USASCII A, USASCII, USASCII £, MANIFOLD, EMPHASIS, USLEGAL 4

Sequence B = US LEGAL 1, USOCR B

Sequence C = USLEGAL 2,3, M/L 2

Sequence D = USOCRA, M/L 1, USLEGAL 4 (PS wheel)

Switch 3-5 controls the paper-out detector. With switch 3-5 OFF, the printer does not stop when the paper runs out. With switch 3-5 ON, the printer stops printing about 2 inches from the end of the last sheet. If you are using single sheets (as opposed to continuous forms), this switch should be OFF to allow printing to the bottom of the page.

Switch 3-6 enables draft print (switch 3-6 ON) or disables draft print (switch 3-6 OFF). When draft print is enabled, ribbon feed is decreased and print speed is somewhat increased.

Switch 3-7 enables to install the Auto Sheet Feeder. (switch 3-7 ON). When the ASF is installed, commands for the ASF (eject paper, insert paper etc.) are available, and Premiere 35 senses the paper jamming.

Switch 3-8 selects the hammer energy levels. With 3-8 ON, the hammer energy is higher than normal.

Appendix D
The Parallel Interface

Pin No.	Return pin No.	Signal	Transmitter	Functions
1	19	$\overline{\text{STROBE}}$	CPU	Strobe pulse for data entry Pulse width should be more than 1μs at the receiving terminal. This signal is "HIGH" in the normal condition, and data are read in after this signal has turned to "LOW".
2	20	DATA 1	CPU	Each signal represents the information up to the 1st bit of parallel data. "HIGH" shows that data is logical "1" and "LOW" shows that data is logical "0".
3	21	DATA 2	CPU	
4	22	DATA 3	CPU	
5	23	DATA 4	CPU	
6	24	DATA 5	CPU	
7	25	DATA 6	CPU	
8	26	DATA 7	CPU	
9	27	DATA 8	CPU	
10	28	$\overline{\text{ACKNLG}}$	PRINTER	"LOW" indicates that the printer has received data and is ready to accept next data. Pulse width is about 9μs.
11	29	BUSY	PRINTER	"HIGH" indicates that the printer is not ready for receiving data, while "LOW" indicates that the printer is ready for receiving data.

NOTE: A line above a signal name indicates that the signal is active when "LOW"

Pin No.	Return pin No.	Signal	Transmitter	Functions
12	30	PE	PRINTER	"HIGH" indicates that the printer is out of paper.
13	—	SLCT	PRINTER	"HIGH" indicates that the printer is selected.
14	—	$\overline{\text{AUTO FEED XT}}$	CPU	When this signal turns to "LOW", paper is automatically fed one line after printing.
15	—	NC		Not used
16	—	0V	PRINTER	Logic ground 0V level
17	—	CHASSIS GND	PRINTER	GND level of printer chassis
18	—	+5V	PRINTER	+5V direct output (max 300mA)
19 30	— —	GND GND		Signal GND level for twisted-pair return
31	—	$\overline{\text{INT}}$	CPU	When this signal turns to "HIGH" from "LOW", the printer controller is reset to the initial condition and the print buffer is cleared. The pulse width should be more than 50μs at the receiving terminal.
32	—	$\overline{\text{ERROR}}$	PRINTER	"LOW" indicates that the printer is in: 1 Paper out 2 Ribbon out 3 Printer error
33	—	GND	—	Same as specified in pin No. 19 – 30
34	—	NC	—	Not used
35	—	NC		Not used
36	—	$\overline{\text{SLCT IN}}$	CPU	"LOW" indicates that the printer is to be selected.

NOTE: A line above a signal name indicates that the signal is active when "LOW"

Appendix E
The Serial Interface

The Premiere 35's optional serial interface lets you communcate with a computer that uses a serial port. The user's manual shows you how to install the serial interface.

SERIAL INTERFACE PIN FUNCTIONS

The following chart defines the pin functions of the Premiere 35's serial interface connector.

Pin No.	Signal	Direction	Function
2	$\overline{\text{TXD}}$	OUT	Transmitted data. This pin carries information from the printer to the computer.
3	$\overline{\text{RXD}}$	IN	Received data. This pin carries information flowing to the printer from the computer.
4	RTS	OUT	Request to send. This pin is ON when the printer is ready to receive information and the computer has turned on the DSR pin.
5	CTS	IN	Clear to send. The computer must turn this pin ON when it is ready to send information.
6	DSR	IN	Data set ready. The computer must turn this pin ON when it is ready to send information.
7	GND	—	Signal ground.
8	DCD	IN	Carrier detect. The computer must turn this pin ON when it is ready to send information.
20	DTR	OUT	Data terminal ready. The Premiere 35 turns this pin ON when it is ready to receive information.

NOTES:

1. See Appendix C for setting the switches that configure the serial interface.
2. Data signals are - 12 Volts for logic "1" and + 12 Volts for logic "0". All other signals are + 12 Volts ON and - 12 Volts OFF.

Appendix F
Specifications

PRINTING

Printer Compatibility	Diablo 630, Qume Sprint 11, and NEC 3550
Printing Method	Fully-formed impact, with daisy wheel Bidirectional, logic seeking; unidirectional through software or switch selection
Printing Speed	35 characters per second("AAA" text at 10 pitch) 30 characters per second(Shannon text at 10 pitch)
Print Wheel	96 characters per wheel (plastic Diablo compatible)
Ribbon	Types: Diablo compatible (multi-strike, or correctable carbon) in cartridge Ribbon life: 3.5×10^6 characters
Character pitch	10 cpi (characters per inch) pica 12 cpi elite 15 cpi condensed Proportionally spaced 1/120 inch programmable
Graphics	Programmable to: 1/120 inch x 1/48 inch, or 1/60 inch x 1/48 inch (Qume mode only)
Page width	Pica: 136 columns Elite: 163 columns Condensed: 203 columns
Line spacing	1/6 inch, 1/4 inch, 1/3 inch, or 1/48 inch programmable

PAPER

Paper types	Single sheet, friction feed, up to 16.5 inches (419.1mm) wide Continuous sprocket-feed, with optional tractor unit, up to 15 inches (381 mm) wide
Paper thickness	Original and up to six carbonless copies Single sheet thickness: 0.002 in. -0.004 in. (0.06 mm-0.1mm)

PRINTER

Dimensions	Height: 5.7 in. (145 mm) (excluding paper release lever) Width: 25" in. (635 mm) (excluding paper feed knob) Depth: 15.0 in. (381 mm)
Weight	29.5 lb. (13.4kg)
LCD Display	Displays date and time, alert and error messages, on line and off line status, line spacing, character pitch, and print mode
Error Messages	CHECK PAPER, CHECK RIBBON, CHECK WHEEL, CHECK COVER
Control Panel	Includes ON LINE, TOP OF FORM, FORM FEED, LINE FEED, CPI (Character Pitch), and LINE SPACE switches
Power required	Voltage: 115 VAC ($\pm$ 10%)
Environment	Temperature: 41°F to 97°F (5°C to 36°C) Humidity: 10 to 90%, non condensing
Printer MTBF	5000 hours (25% duty) 25 X 10^6 characters (print head excluded)
Interface	8-bit parallel Centronics standard, RS232-C serial optional
Input buffer	8000 characters

The specification is subject to change without notice for improvement.

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Citizen America, Inc. Limited Warranty

Citizen America, Inc. hereby warrants that it will repair or replace, at its option, any part of the Citizen product with which this warranty is enclosed which proves defective by reason of improper workmanship and/or material, without charge for parts or labor, for a period of one year. This warranty period commences on the date of original purchase by the buyer other than for purposes of resale, and this warranty applies only if such original purchase by the buyer was made in the United States.

To obtain service under this warranty you must return your Citizen product, properly packagd in its original container or an equivalent, to the nearest authorized Citizen Service Center or the Dealer from whom the product was purchased. Any postage, insurance and shipping costs incurred in presenting or sending your Citizen product for service are your responsibility.

The Dealer's original bill of sale or other satisfactory proof of the date of the original buyer purchase of your Citizen product must be made available to obtain service under this warranty.

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11264 Playa Court, Culver City, CA 90230
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